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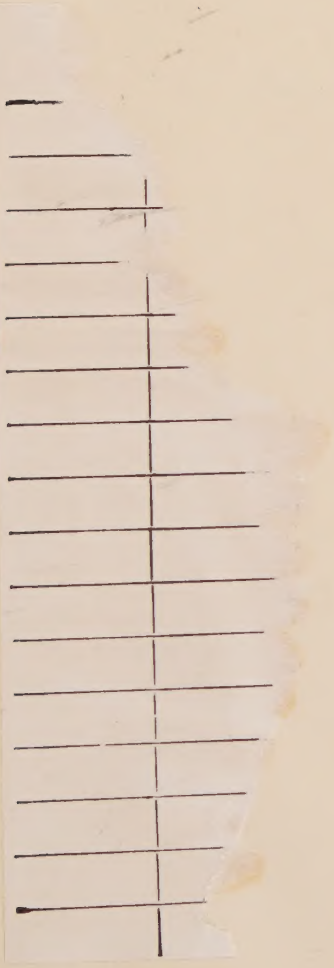

THE STIR OF NATURE

WHITENESS AND THE WHITE-TAIL

HSS 10.1

THE STIR OF NATURE

A Book for Young American Naturalists

By WILLIAM H. CARR

Assistant Curator of Education in the American Museum of Natural History

With a Foreword by CLYDE FISHER, PH.D., LL.D.

Illustrated by THOMAS W. VOTER

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TO MY MOTHER,

who has been a friend of young naturalists all of her days, this book is affectionately dedicated

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FOREWORD

"Man can have but one interest in nature, namely, to see himself reflected or interpreted there. He quickly neglects both poet and philosopher who fails to satisfy in some measure that feeling." —JOHN BURROUGHS.

THIS observation of the Seer of Slabsides is an important and fundamental truth. In fact, the statement might have been extended to other fields, such as sculpture, painting, and literature. This principle should be kept in mind by every parent and teacher,—by every nature leader.

The author of *The Stir of Nature* evidently appreciates this philosophy and has written first-hand accounts of his real adventures with animals in a fresh and sympathetic style. Mr. Carr happily combines the enthusiasm of youth with the accuracy and caution of the mature naturalist. Although this is his initial book, it is not his first appearance in print. He has written a number of successful pamphlets, including a *Manual of Bird Study,* and has contributed to the magazines. He was editor of the *Camp Naturalist* for three years. This exceedingly attractive camp magazine was widely circulated throughout the United States.

From the very beginning, Mr. Carr has had charge of the outdoor museum and nature trails of the American Museum of Natural History at Bear Mountain. This pioneering nature project, located in the most beautiful part of the Hudson Valley,

has been so well directed that it has gained well deserved national and international recognition. Much of the material for *The Stir of Nature* was gathered at Bear Mountain and in the Palisade Interstate Park, where the author has spent many years, both as a nature instructor and as an observer of wild life in the open. His contacts with the thousands of boys and girls, and with their leaders, has served to greatly enrich his writings.

The reader is soon aware that he does not need to journey into distant lands to find things of interest, but that he may discover animals with fascinating life-histories in his own dooryard. Many of our greatest nature writers have found all needful inspiration without traveling afar, John Burroughs, Thoreau, and Gilbert White, to mention only a few.

Certain helpful bird timetables and lists, as well as the "Mammal Calendar" are based upon the combined results of observations of other naturalists, supplemented by those of the writer. The most interesting parts of the book are the original accounts of the crow, the skunk, the beaver, and the salamander. Mr. Carr encourages the young naturalist to make his own discoveries afield.

As a boy, he won the rank of "Eagle Scout" while connected with Boy Scouting in a troop on Long Island. Perhaps there, he learned the importance of a personal understanding and individual appreciation of nature. At any event, he has now passed this spirit of endeavor on to others. *The Stir of Nature* will do much to stimulate understanding and enjoyment of nature in a wholesome way. I take pleasure in commending the book to the youth of America.

CLYDE FISHER.

American Museum of Natural History,
New York City, April 5, 1930.

PREFACE

SIGNS in the open may be read the world around. They are invitations, written in nature's universal language, and beckon all who walk in the out-of-doors. Every animal, large or small, every tree and flower, has its individual peculiarity. I hope this book will help to interpret some of the phases in the lives of our native animals and will show several means of sympathetic approach to the life-stories that lie beyond the signs. I have tried to present a fairly complete list of animals that may be discovered in the northeastern United States and have not forgotten the fascinating creatures of the South and West. At the beginning and at the end of each chapter will be found the names of famous American Naturalists with whose writings every aspiring young naturalist should be familiar.

I owe a debt of gratitude to Dr. Clyde Fisher who made it possible for me to write this book and who carefully read the manuscript; to Hazel L. Muller, and to my wife, Marion B. Carr, who, by their helpful suggestions and criticisms, gave invaluable aid in the preparation of this volume. I am also indebted to the American Museum of Natural History for permission to reproduce many of the photographs illustrating the text. I wish to further thank the boys and girls and nature leaders of the Palisade Interstate Park who have, from time to time, wandered in and out of these pages. Also, I must not forget my nature-minded friends in many other states of the Union, from California to Maine and from New York to Florida, who have contributed consciously or unconsciously to these pages. If you, who read this little book, derive a fraction of the pleasure that I have experienced in writing it, then I shall be glad indeed.

April 6, 1930. WILLIAM H. CARR.

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CHAPTER ONE

SIGHTS AND SOUNDS

"Absorbed in the happy scene, given up to dreamy, random observation of what lay immediately before me, I was not conscious of anything occurring on the outer rim of the landscape." —JOHN MUIR.

IN northern New York State, far above the ancient Adirondack Mountains, is a little river that flows sometimes gently and sometimes swiftly as it goes down and down to the sea. The brown, leaf-stained water makes its changing way among smooth, slippery rocks, into shallow pools and along green and gray forest-lined banks. At one shadowy spot, tall dark hemlocks and spruces reach straight up toward the sky. Here the river, at first very deliberately and then gathering speed like that of a charging host of cavalry horses, takes a great, dashing leap into the canyon-like channel far below. The farmers who live nearby call the thundering waters, "Allen's Falls." Not far away, standing patiently on a high rolling hill among many clean-leaved apple trees is a little old house. When one climbs over the cedar-shingled roof to where the chimney rears its dark, red head above the gable, one may see faint wisps of smoke rising from the steamers on the distant St. Lawrence.

This roof top, so near the falls, makes a wonderful seat on

warm summer days, for a cool breeze bearing the breath and the music of the water comes up from the valley and rustles in the tree tops. One feels as though he were really in the trees. They cluster all about so comfortably and seem, somehow, to be companionable and very friendly. Oh! the roof peak is a fine location from which to see the lands round about and to dream real, summer dreams of the peace and quiet of the country. Always, comes the low, rushing sound of the St. Regis River as it jumps headlong into the waiting pool ever splashed with white spray.

Yes, there is a very keen joy in sitting still up there on the rain-washed shingles and just looking and listening to the sights and sounds that the world has to offer. It is the world of nature; the world of the trees, the birds and the clouds. Even the old gray woodchuck sunning itself on the stone wall, where the blackberry vines struggle for a foothold, is a part of that world; and the yellow butterflies, dancing up and down above the small garden, also have their important places in the warm sunlight. Everything has its color. The red squirrel, dashing recklessly along the top-most crooked bar of the split rail fence, lends a bright streak of russet as it bounds into an apple tree in search of seeds so well hidden beneath their skins and pulps.

One may not sit up there on the roof beam very long without beginning to wonder about the nearby and the far-off things that are to be seen and heard. Where do the butterflies come from? How do the squirrels know there are seeds in the middle of the apple? Where does the river start, and what makes it follow the same course, year in and year out, as it sweeps on through the centuries?

Now, it is one thing to wonder about all of these puzzles and it is another to solve them; to discover what are the answers to these and to other equally fascinating questions.

Down below, in the old farmhouse, some one is busy with the dinner dishes. One may hear the soft "thump" as they are being placed upon the pantry shelves after they have been washed and dried. One recognizes that sound, for it has been heard often. The back screen door closes with a "bang," as some one goes to the deep well to pump a pail of cool water. The "squeak" of the pump-handle is another well-known sound. Even if one were in the dark haymow up in the barn, he would still hear the pump making the same complaint and the same "squeaky" protests as it was forced to draw up the water that always seems so reluctant to leave its damp clay bed.

These are sounds that may seldom be mistaken, just as the sight of "Bessie" and "Carey," the two tan horses, though they were a long distance away on the dusty road, could seldom be confused with the sight of any other horses. These animals have a certain "swing" to their bodies; a familiar way of stepping, that would tell without a doubt that they could be no other than the two carriage horses whose home was in the barn. Of course they are "Carey" and "Bessie," one simply knows. One may be positive of these facts because of having grown to know every motion of the two horses and having lived with the song of the pump. He may well be certain of the sound made by the dishes upon the wooden shelves, for many are the dishes that he has had to dry and put there himself!

But what about that soaring hawk, sailing so gracefully overhead? It has circled above the falls for a few minutes and now is coming nearer and nearer. What kind of a hawk is it? There are many different hawks, but it seems that this one is seen most often. The farmers say that it is a "Hen-hawk" or a "Chicken-hawk," but they call other hawks by the same name too! Surely they must be mistaken! The large bird draws quite close as we

ALLEN'S FALLS IN SHADOW AND SHADE

sit perfectly still. One may plainly see that the ends of its wings are rounded and that there is a dull reddish tinge upon its shoulders, as it glides down over the field directly in front of us and below the level of our eyes. In the house, there is a good book about birds. The hawk with scarcely a "flap" of its wings is now going around and around in slow circles, rising higher and higher until at last it appears as only a black dot against the sky.

While the impression of the bird is still fresh and clear in our mind, we slide cautiously down the roof, take a firm grasp upon the trembling eave spout and reach the ground in safety. The book says that the bird is a Red-shouldered Hawk. Without a book, we could have made a good effort to give it that name ourselves! Uncle Elias, who sits on the porch reading, confirms this name and says that the rounded wings and the red-shoulder would be all the information needed to "fix the name."

"Are you sure that you saw red on the shoulder?" he asks. "One does not get so close a view very often."

Uncle Elias, who has long since left forever the country that he loved so well, was a careful observer of nature. He could tell one a great deal about birds and other animals and many were the questions that he answered. All his life he had been a close observer of nature, although he would probably have laughed if anyone had called him a naturalist. His answer would have been that he was merely a farmer!

This brings us to the question, "What and Who is a naturalist?" What are the qualifications, the special habits and the talents that one must have to be really known as a "naturalist"? The answer to this is quite simple. In order to be a naturalist, one need only to have a sincere and honest love for the creations of nature and to show this love by taking the pains to seek some

of the meanings, some of the facts that lie behind these same creations. One must really "do something" to prove worthy of the name. A naturalist is a crusader for truth about nature.

You may ask just what it is that you may do. I would suggest that, in the first place, you keep a journal of the various discoveries that are made; of the birds that you see and know; of the times when certain flowers bloom and of any interesting event or experience that may be yours. Your memory may be good, but if you want to remember these things, a journal is the only answer. There is great sport in keeping a journal, anyway. Sea captains, explorers and other people who have worthwhile things to record, all keep a log-book or journal. Surely the things that you may see are worth writing down! A journal should be a part of you, and it will be if you keep it for very long. It will be of value to others, too. This is only one of the many good reasons for keeping it. As you grow older, references to your earlier notes will give you much satisfaction and joy. By all means, keep a true nature journal!

Out in a coast town, near the end of Long Island, lay a time-worn, dusty sea chest, filled with the log-books of sturdy whaling captains of another day. One summer, almost a hundred years after the chest had been locked, the dingy lid was pried open and one of the old, leather-bound books was taken from the blackness. Its yellow pages told the eventful story of the dangerous journeys of a sailing ship around the world in search of "Moby Dick," the whale. Little drawings, here and there, showed how some keen-edged harpoon had wounded and finally killed the huge sea animals that provided oil to light the houses of people in far-off New England. A thousand adventures in distant oceans were recorded. Had it not been for this log-book and others like it, together with similar journals of travel and of the all-important

things of every day life as well, the world would be ignorant of many things that have vanished for all time. Keep a log-book, or a journal. You will treasure it in days to come!

Making a nature collection or a museum of your own is another thing that you can do to help qualify as a naturalist. Nearly every one of us has had or will have what some people call the "collecting instinct," at some time or other. Like the bower bird of Australia, we bring strange things together even if it is only to "play" with them. Some persons collect postage stamps, or old books, or queer "knicknacks." A nature collection is an excellent scheme. One should learn, first of all, what *not* to take. It goes without saying that birds' eggs, rare flowers, or like things should never be a part of your museum exhibit. You would do well to collect and to keep the things that you study, such as common flowers, weeds, rocks and minerals, deserted birds' nests, taken in the Fall of the year, insects and so forth. No elaborate or expensive equipment is needed for the storing of these objects. Cigar boxes will do! It is easy to learn to make plaster of Paris casts of bird and animal tracks, models of animal homes and other similar interesting objects. If you do this you will be accomplishing some real purpose and learning a great deal as you go along. Your collections should be of value to you.

Live exhibits may be kept too. You may have turtles, frogs and toads, and snakes, for instance. If you do keep these creatures, always be sure that they are well-fed and cared for properly. Boy and Girl Scout Troops may very well have these exhibits in their home or camp museums. It seems a bit selfish to have a collection of live things all to oneself. Why not share it with others? Schools with nature rooms could help you with your "live stock." More of this later!

Of course, a boy or a girl may be a naturalist quite as well as

may an older person. By means of their studies, some naturalists earn the money with which to live. These are "professional naturalists" whose joy in their work is often as great, or sometimes greater, than that of the amateur. The vast majority of naturalists, however, are the ones who strive to know more of nature because they are truly happy to be able to adopt nature study as a hobby; and what a splendid hobby and pastime it is! What an ever present gratification or spirit of gladness one may have who goes on through life learning how to appreciate and to know the wonders that nature has to offer.

Uncle Elias was a farmer, it is true. He knew how to get up in the early morning, to milk the cows, and then to work all day long in the fields. Yet he also was a naturalist, for he knew the names of the birds and trees, of fish and of rocks, and many other things. He was *interested* and *wanted* to know! He took the delightful effort to study them in such a pleasant way that his knowledge increased year by year. No one asked him to discover these things. He was not taught about them in the little red-brick schoolhouse wherein he spent so few years. No, he made his little expeditions of learning simply because he wished to do so.

I know many boys and girls who are excellent young naturalists. Some like the trees, and flowers, and others the birds, the reptiles and all of the animals. They, too, love nature for its own sake. They are not satisfied by mere book knowledge. Of course books are very helpful, sometimes. Often one may not go very far without them. After all, though, nature lives in the open, she will not come to you. She invites you to go to her; and when you have gone she will yield many of her secrets that await you in the streams, the woods, and the fields; and always will there be new secrets to find. No matter if you live to be as old as

Methuselah, you will never learn them all. This very fact is one of the things that makes nature as a hobby so worthwhile. The game is never finished, for the goal is ever just ahead. No doubt, you have read books you enjoyed so much that you were sorry when they ended. It would have been fine to read on and on. Well, nature is the most wonderful book in the world, and it is a book that never comes to an end. You may turn the exciting, the adventurous, and the ordinary pages all of your life and never reach the last.

There are many different ways in which one may learn to solve various mysteries and unknown facts of nature. The most useful things are, first, a good pair of eyes, and, second, a keen interest. If the boy, leaning against the chimney, high on the old farmhouse roof, had not been filled with a desire to name and to learn of the hawk that came so close to him, he would not have left his seat and scrambled to the ground; but he *did* want to know and that is why he made his discovery. One may sit upon roof tops or may wander aimlessly through the woods and fields for hours upon hours, yet he will learn very little unless he takes an *active* notice of the things about him.

I have taken active notice of Allen's Falls for many years, yet I did not tell you all of the story. As a matter of fact, there are two falls instead of one. A little island, like a monument in the center of a highway, stretches its solid length between these two streams. Upon one side, the water jumps far and high; but on the other, it flows easily along and is content to reach the stream bed below only after many hesitations. On this side, the course is filled with tremendous boulders and deep pot-holes left by the glacier of long, long ago. Small spruce trees have found support here and there upon this tumbled surface and live very bravely upon the face of the giant's stairs. On one hand, the main

stream flows swiftly, and on the other, the water traffic is in no hurry. It pursues its leisurely way, now with a short burst of speed and now almost completely halted by some enormous, upright boulder. Nevertheless, it never quite ceases to trickle down. Many quiet pools are formed, giving back from their mirrored depths, reflections of the trees and clouds. The principal fall is a masterful picture of might and power. One may sit nearby and be held fast by its spell; completely absorbed with the surpassing beauty of the river's amazing burst of freedom.

The little fall, however, is altogether opposite in its appeal. It is the difference that exists between the great city cathedral with all the bells crying out, and the peaceful, white, little country church, slumbering in the noon-day sun. The numerous pools of the "little falls" are visited by birds and other animals that come to drink and to fish. If one be well hidden among the fringing tree trunks, he may see some of the creatures as they approach. This is a fine place to learn about the habits of the mink, the great blue heron, the spotted sandpiper, and other wild things. One evening, a cautious raccoon tried to cross above a pool on a slippery log. Suddenly losing its footing, it fell with a splash into the pool! It had hardly reached the shore, when, with a quick turn and a thrust of both forefeet, it drew out a large crayfish whose pincer-like arms waved wildly in the air. Soon the pincers ceased to wave and the raccoon had made a meal!

The "big falls" gives us inspiration, but the "little falls" gives information as well! We are able to enjoy nature, in a great way, on the one hand, and to study it closely on the other. The island is the dividing line. In either case, the beauty of the scenes are not lost to us. We are fortunate, indeed, that nature gives to us the magnificent as well as the small. It should be our desire never to lose sight of either one. The grassy hills with their

CAUTION AND A SLIPPERY LOG

crickets and meadow-larks are not to be forgotten and neglected for the rocky heights of the mountains. Indeed, the mountains are but the brothers of the hills.

CHAPTER TWO

FOUR FEET AND TWELVE MONTHS

"A knowledge of animals doubles the interest of an ordinary country ramble—and the more we learn their ways, the more glimpses we will likely get of them!"

—ERNEST THOMPSON SETON.

IN a white, winter day at Lake Sebago, a sharp wind was whistling shrilly among leafless trees about the frozen lake. Walking out toward the middle where the blue ice was thick, we suddenly heard beneath our feet three smothered splashes, and then silence. Our footsteps had drawn too near the beaver house; in fact we were almost upon it and the lodge dwellers had taken to the water in alarm. We were a bit surprised to observe that they had made this frigid plunge. Their snow-covered, dome-shaped house of branches, twigs and mud was frozen so solidly that it would have taken a long time to force a way into the warm sleeping chamber. We hoped the home builders, the engineers of the animal world would soon return.

In the yielding snow, upon the top of the beaver lodge, was a delicate tracery of small imprints, true patterns in the coverlet of winter. By examining them closely, we could see that a mink

had stolen out upon the ice and had preceded us upon an investigation tour. The mink went straight to a spot in the very center of the dome where the snow had been melted by the heated air that arose from warm, heavily-furred bodies within the chamber. No doubt the beaver scent excited its curiosity, for it had circled the dome roof several times and had pawed the snow away from the ventilation hole. Finally, the inquisitive visitor had gone away in the opposite direction from whence it came. To read this story in the snow was easy. The toes of the exploring animal pointed the direction as clearly as so many arrows.

As young naturalists, let us here record the things that we have observed in our short walk and discuss what we have learned. Even though we have seen neither mink nor beaver, we have found out some "bits" of information about them both. We have seen and heard:

1—Three splashes beneath the ice indicating the number of animals that have been living in the lodge.

2—The beaver lodge itself with its almost solid structure.

3—The "ventilation" hole in the top of the house.

4—The telltale tracks of an investigating mink.

These observations are interesting in themselves but what do they mean? What is the rest of the story? We shall not get it by simply standing here upon the lake, becoming colder and colder as the wind continues to whip down the tree lane. If the sights have aroused in us a desire to know more about these and other mammals, we must return again and again, to look for other eventful signs. It will aid us if we know beforehand some of the things to expect. We have prepared an animal almanac which will hint at some of the things to look for in the world of animal life in Winter, Spring, Summer and Autumn. You may fill in the gaps in the calendar for yourselves.

JANUARY:

The does and bucks of the Virginia or White-tailed Deer are together in numbers in sheltered places in the woods, known as the "deer-yards." The bucks lose, or shed, their antlers.

Tiny tracks in the snow may tell of the wanderings of the White-foot, or Deer Mouse, that braves the cold for a time to search for food.

White sections of branches, with the bark gnawed away, may be seen through clear ice near beaver houses. After the bark has served as food, the bared branches are discarded.

A warm day may bring the Porcupine out into the sun for a brief hour. The sleepy animal will doubtless make a meal of hemlock bark and then return to its nest.

The Chipmunk, the Jumping Mouse, the Black Bear and the Woodchuck are all sound asleep in their warm dens or nests.

The Skunk sleeps most of the winter, but warm weather may tempt him and he, too, sometimes walks in the snow.

FEBRUARY:

The Woodchuck will be about during the month.

Beaver will mate.

The Red Fox is active as he searches for food. His bushy tail may leave its soft mark in the vanishing snow as he walks and runs here and there.

Many of the heavy sleepers feel the call of coming Spring. Perhaps you may discover the Chipmunk on some very sunny day.

Beaver will be feeding from trees on the shore as soon as the ice permits them to escape from their winter quarters.

MARCH:

Red Squirrels mate this month and the early part of April.

The Muskrat is swimming about and seeks fresh green plant roots wherever he can find them.

The Mink and the Otter find that fishing may be easily carried on now that the ice is nearly gone.

Beaver are feeding on the shore in earnest. Their winter food supply is no longer needed.

The Gray Squirrels are beginning to beg for food in city parks.

APRIL:

The gentle, little Flying-squirrel mother gives birth to her young toward the end of the month.

Baby Woodchucks also make their first entry into the world toward the end of the month and are quite blind for a time.

The Jumping Mouse may sleep to the end of the month or the early part of May.

The Snowshoe Rabbit casts off its winter coat and appears garbed for Spring.

Late this month, or in early May, young Skunks are born.

MAY:

Does are now sleek and fat; the fawns are born in the middle of the month. These babies weigh about four and a half pounds.

Now Red Squirrel babies are born.

Beaver Young are born, too.

The Mink and the Weasel, especially the Weasel, know that many animal babies are about. These young ones make excellent meals for these two members of the Weasel tribe.

JUNE:

Solemn little Raccoons may be seen sitting quite still as they sun themselves on the branches near their nest hole.

Young Red Squirrels follow sometimes in the footsteps of their mother as she goes about among the trees.

The sun also attracts baby Woodchucks. The round creatures tumble out-of-doors for the first time.

Cottontail Rabbits are about in the open woods and fields. They may have babies in a nest upon the ground during the early part of the month or the later part of May.

JULY:

Spotted fawns of the Virginia Deer follow their mothers through the woods, quick to know when danger is near.

Red and Gray Squirrels are feeding upon nuts and seeds. (Sometimes the Red Squirrel will eat the pulp as well as the seeds of apples.)

Muskrats are home building. They often build several dwellings before they make one that apparently satisfies them.

The Beaver pond is quiet; little activity can be observed.

Photograph by Clyde Fisher. Courtesy the Am. Mus. Nat. Hist.

A NEW YORK WEASEL'S EARLY APPEARANCE

Photograph by Clyde Fisher. Courtesy the Am. Mus. Nat. Hist.
TAME DIET FOR A WEASEL

Skunks are visiting garbage piles and cans in many summer camps.

The White-foot, or Deer, Mouse may cover a deserted bird's nest with grass and sleep there during the day.

Bats dart about on warm nights.

Weasels are bold. You may see one in pursuit of a Chipmunk or a Rabbit.

Red Fox young have ventured from their dens.

AUGUST:

Virginia Deer's antlers are now full grown though, like the staghorn sumac, they are still in "velvet."

Young Chipmunks are well developed and are able to care for themselves.

The young Woodchucks also are nearly full grown.

The Jumping Mouse prepares a deep burrow late in this month or early in September. It is one of the longest and heaviest of "sleepers."

Blundering young Porcupines may be seen about alone.

The young of the Mink are now fending for themselves.

Beaver are active in their colonies.

SEPTEMBER:

The Woodchuck is apt to retire for the Winter toward the end of the month or the early part of October.

Young White-tailed Deer are weaned. They shed their spotted coats at about the same time. The buck has scraped the velvet from its antlers.

Red and Gray Squirrels are at work with their annual harvest, storing supplies for the winter months to come. Do you know that these two squirrels have different methods of hiding their food?

Beaver are working upon their winter food-piles. Their dams and houses are being repaired and, in other ways, they are getting ready for the time when the ice will come between them and the sky.

Sluggish Crickets and Grasshoppers are preyed upon by the hunting Skunks which are putting on a thick layer of fat to warm them during the cold months soon to come.

OCTOBER:

The Woodchucks are so fat it is a marvel that they get about at all.

The Snowshoe Rabbit turns white.

Beaver are nearly finished with their winter preparations.

Mice are busy in the corn fields.

Squirrels' leafy nests appear in the branches of tall trees.

Photograph by Mary C. Dickerson. Courtesy the Am. Mus. Nat. Hist.

THE CHIPMUNK TURNS ITS BACK

Young Muskrats have left home to shift for themselves.

Cottontail Rabbits are having some difficulty in finding cover.

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NOVEMBER:

The rutting time of the Virginia Deer has come.

The song of the Chipmunk is gone!

On warm days the Skunk still explores.

The coming of Winter brings new dangers to the Meadow Mice. They are likely to be eaten by Owls when they are abroad on the snow, which makes them conspicuous.

Raccoons spend their time near the home tree.

The Black Bear will enter upon his "long sleep."

DECEMBER:

This is the season of many tracks in the snow. It is a fine time to learn about the wanderings of certain animals for the snow is a diary of events of the four-footed.

In mild weather, the Chipmunk may come out of its den for a time. So heavy a sleeper is only lured forth by an amiable sun.

In some hollow tree, two or three Raccoons may be living together for mutual warmth.

A heavy thaw, or melting of snow and ice, may cause the Muskrat's home to "cave in." This will be due to the fact that the Muskrats have weakened the top of their structure by eating it from the inside. They literally "eat themselves out of house and home"!

Deep snow and icy crusts mean danger to the Virginia, or White-tailed, Deer. Their slender legs are often cut and their bodies are apt to become "bogged down."

If you have read through this "Calendar," you may easily see

that just a few observations have been made. It remains for you to fill in some of the blank spaces. Your own observations may be most important and, here, once more, is where your journal will serve in good stead. Names, dates and places are all necessary. If possible, you should try to notice some of these things in the animals that you may see:

Has the animal a voice?
Where does it live?
What is it eating?
When does it mate?
When are the young born?
How soon do the babies get about?
What sort of track does it make in mud or snow?
Does it run, leap, walk, hop or climb?
Is it nervous or shy, or is it unafraid?
Can you describe its appearance?

These are, when we are considering the families of animals called "mammals," questions which are well worth answering. As a young naturalist, you will be able to answer many of them.

Three very good books to read on the subject of mammals are:

"Animals" by Ernest Thompson Seton, the Nature Library, Nelson Doubleday Inc., 1926.

"American Animals" by Witmer Stone and William Everett Cram, Doubleday Page and Company, 1920.

"The Minds and Manners of Wild Animals" by William T. Hornaday, Scribners' and Sons, New York City.

CHAPTER THREE

COLLECTING TRACKS

"The tracks and records in the snow which I read in passing made something of a daily newspaper for me. They told much of the news of the wilds." —ENOS A. MILLS.

OU remember Chief Forester Griswald told us that the beaver were flooding altogether too much land above the lake?" asked Tom. "Well, last night he destroyed the whole colony. He dynamited all three dams, the main one and the two smaller ones below. I think it is a downright shame!"

We all agreed with Tom. It was a shame! For months we had gone, day after day, to the shores of the little pond to sit for long, utterly peaceful hours in the late afternoon and evening to study the ways of the animal home builders. We were all very much attached to this particular beaver colony which we had learned to call "ours."

"Mr. Griswald might have been kind enough to let us know what he was about," continued Tom. "He knew how interested we were in watching the beaver and in taking their photographs. Think of what a wonderful chance it would have been!"

"It's too late now," we answered. "The work is done. Probably the beaver have gone away."

Photograph by F. Martin Brown

BEAVER DAM

No more could we observe the flat-tailed water-dwellers. We reflected sadly upon the charm of the woodland pond where the silent yet ever watchful creatures had toiled for three years in the construction of their lodges and water barriers. A few sticks of explosive powder had banished the householders in a single night. What a cruel method of ejection it was! As we sat there, looking out over the motionless blue lake, we discussed the situation and finally reached the conclusion that "There was nothing to be done about it."

"It's all over," said Tom, mournfully.

Right there, however, is where we made a mistake.

"Did you ever see any beaver tracks?" asked a man who had come just in time to hear the last of our arguments.

"Yes," we answered, "a few. Most of them were poor ones in small patches of mud. We have seen them in winter but they were spoiled by the animal's tail which had dragged snow into the imprints."

The newcomer was an artist who was visiting camp for the express purpose of making drawings of animal tracks. He was a keen observer who took full advantage of any opportunities to make sketches.

"You fellows are missing something," he said. "If you don't know what, just follow me; I'm off!"

It was soon apparent that the beaver pond was our destination. We arrived there shortly and what a desolate, discouraging scene it was. Tall, naked trees, with blackened branches stood starkly silhouetted against the green of the surrounding woods. Out in the center of what had once been an active beaver home, stood the deserted house with its entrance now fully exposed. It was a monument to the industrious, happy days so suddenly gone.

The artist, leading the way, presently discovered the "some-

thing" he had promised to show us. There, near the former shore line of the pond, were many excellent beaver tracks in the plastic mud. Never before had we observed so many perfect ones. Careful searching revealed a number of raccoon tracks, too. This contented, little, "spectacled" wanderer had evidently been much interested in the strange appearance of the beaver colony, for it had ventured near the lodge and there had explored the mud bed quite thoroughly. A red squirrel had been upon an investigation tour, too; so had several white-footed mice. Two deer had walked daintily across one corner of the pond bottom without having paused in their steps.

"Why, this is a regular mud album," said the artist, who immediately brought out his sketch pad and pencil and commenced to copy beaver tracks. He completed several drawings of individual impressions and then sketched the footprints in a series so that he might know how the animal walked along. In the water, the beaver is the very picture of grace and ease; but ashore it is indeed clumsy as the track impressions revealed. After a time, our artist was satisfied with his beaver drawings and turned to the raccoon tracks.

All of this interested us very much. We were somewhat ashamed that we had not come prepared to do some real work. A would-be nature artizan should never venture forth without tools.

"Why are you so interested in tracks?" asked Tom. "Please tell us something about them."

We were now seated on a large, fallen hemlock that made a fine resting spot. The artist paused in his work and before answering, scraped some of the mud from his shoes with the aid of a broken stick.

"It's a long story," he said. "You probably know that some-

time and somewhere, practically all animals leave tracks. Even the Dinosaurs, which lived and died as a race, millions of years ago, left a few footprints that may still be seen. Of course, we are not so fortunate as to have many of these permanent tracks. Anyway, I am glad of it. I enjoy seeking for new ones; for fresh signs that other people have not seen.

"The Winter season is perhaps the best time of year to look for footprints. Soft snow easily records the tracks of animals and, due to the fact that the entire ground is covered, one may find these impressions over a considerable area. However, the Summer time, as well as the Spring and Autumn, also provide many opportunities for the study of footprints. As a matter of fact, every month in the year is good.

"Swamp lands will present many types of tracks such as you see here on the floor of the drained beaver pond. Wet places on the banks of small brooks and streams collect the records of birds and animals that may pass along night or day. Sometimes, it is possible to follow the deer, and other of the larger animals, for miles by means of clearly marked trails in the earth. Such a trail will tell much of what the animal was doing; where it paused to feed or look about, or where it ran or lay down. In order to get as much of the story as possible, I make drawings of as many arrangements of tracks as I can discover. A real series of drawings of footprints is much to be desired."

Tom had another question.

"Have people known much about tracks in years gone by?" he said.

"I should say they did!" exclaimed the narrator. "The Indian of not so many years ago and the backwoodsman, alike, were past masters at the art of track identification. They were largely self instructed from childhood and learned to tell one

animal track from another almost as readily as we can tell the time with watches. Their very lives often depended upon this tracking ability. Today, however, not so much is known of animal footprints. True, there are many hunters and trappers in outlying districts, who are well versed in tracking lore; but the naturalist is in many instances not as familiar with tracks as he should be."

"All this is very fine," said Tom, "but how may we learn something about these tracks? How may we remember them? I would like to make a collection of tracks, but you can not pick up a hole in the ground and bring it home!"

"You are right there," laughed the artist. "One can not pick up a hole! What you *can* do, though, is to either make a drawing of it, photograph it or use it as a mold for the making of a plaster cast, which by the way is a very simple thing to do."

"How about drawing?" said Tom. "I am no artist. I never will be one. How may I draw tracks?"

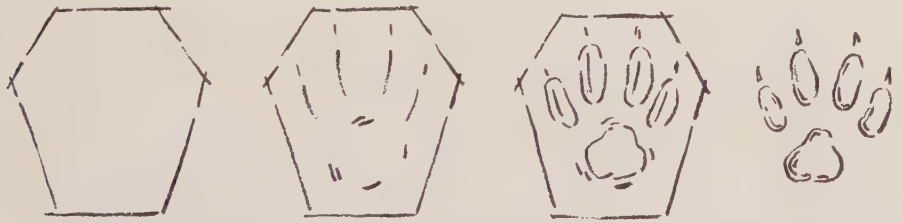
"One does not have to be an expert in order to draw tracks," returned the illustrator. "A good pair of eyes, a pencil, and a ten cent notebook are all that are required.

"Before attempting to reproduce animal tracks in any form, you should first know something about the different kinds of footprints. It has been said that it is possible to determine what an animal eats by means of its footprints. For instance, a skunk with its flat, rear feet, does not hurry to its meal. Not a great deal of speed is needed for the capture of its prey. A bobcat, on the other hand, has to stalk and then spring upon the unfortunate bird or rabbit.

"Perhaps the first tracks to study are the ones nearest home, the dog and the cat. The cat, whether it be a Canada Lynx or a tame house cat, is a very superior animal as regards muscular

characteristics. Its feet are as perfectly developed as the rest of its body, and the claws are retractible (they may be drawn in and out, whenever the animal wishes). Of course dogs' and foxes' claws are always in sight. Both types of feet make tracks in which the toes or the digits of the paw or foot are shown as separate marks and imprints. In reproducing tracks in a drawing, we find that an outline is most useful. I might say here, that it is often possible to draw tracks when their poor condition renders plaster casting impossible. For tracks, such as those of the cat and mink, this outline is helpful."

"The tracks of dogs and foxes adapt themselves to this drawing outline."



"These sketches will really help in planning your drawings. You may be able to develop better outlines for yourself after a bit of experience.

"The footprints of bears, raccoons and skunks are called *plantigrade* tracks. They are so named because the greater portion of the animal's foot is shown in the tracks. You will remem-

ber that only the 'pads' and claws showed in the dog and cat tracks. The plantigrade animals have been called 'flat-footed.' You will discover that the rear foot of the skunk, the hand-like imprint of the raccoon and opossum, and the slender tracks of the mice and rats, may well be included within an outline such as this:"

"Footprints of animals, such as the deer, sheep, moose and elk may be called *hoofed* tracks. Deer and other hoofed animals make footprints that may be readily drawn within these guide lines:"

"When drawing deer tracks, look for sign of ground pawing and notice the distance and the position of tracks from a center line."

At this point in our conversation, the need for food was impressed upon all of our minds, so we walked back along the shore of the lake to camp. During the evening, we investigated other means of copying animal tracks. Once more our friend assisted us. There follows a list of suggestions that he gave.

Plaster casts of mammal and bird tracks are not at all difficult to make. They preserve the track for a life time. One may gradually secure a large collection which will be highly prized. We do not like the idea of making book-ends and other things of this type from tracks, any more than we like to see animal skins placed upon the floor. When it becomes necessary to create a "fad" to increase an interest in nature study, then it is time to take stock of nature teaching methods, to discover just how far we are going from the main trail. Our interest, after all, is in the animal and its ways, not in how we may create mundane objects from its by-products. We like the idea of collecting tracks for their own sake.

Equipment for making Plaster Casts:

An old, flat-surfaced table knife, a mixing bowl, soft tooth-brush, about five pounds of plaster of Paris, and some flat strips of cardboard or thin sheets of zinc are needed. (Zinc cuts and bends easily and is very cheap.)

Making the Cast.

Prepare the track for the liquid plaster by placing strips of zinc or cardboard at least an inch from the imprints on every side. Simply push either of these objects down into the mud so that they will form a wall from which the plaster will not escape. Ordinary paper clips aid in holding the form together. Often, you may make this form from surrounding mud.

Mixing the Plaster.

Your hands are most useful in this operation which involves a combination of plaster of Paris with water. Remember that there should be about four-fifths of the amount of water in the bowl to the amount of plaster used. Thomas MacDowell described the mixing process very well. He said,

"Sprinkle the dry plaster slowly into the water until little islands begin to appear on the surface. Then, with your hand, stir the mixture slowly until it is of a uniform consistency throughout. If the water be ice cold, the plaster will 'set' slowly; whereas, with warm water, it 'sets' rapidly. Adding a small amount of common salt also assures a rapid setting. The two things to avoid are lumps and bubbles."

Pouring the Plaster.

When the plaster is well mixed, pour it gently into the track until it has reached a height of about one inch. Stamp upon the ground near the track, being careful not to disturb the form. The vibrations will help in driving the plaster into the crevices of the footprint.

Removing the Cast.

Let the plaster dry for about three-quarters of an hour and then, carefully, raise it from the ground. Use the knife to scrape off the outside edge. Wash away the heaviest of the clinging earth. Do not use the soft brush until the cast has dried for at least twenty-four hours.

Making a "Positive" Cast.

The cast that has been taken from the ground is a "negative" one. It shows the actual track in bas-relief. No doubt you will wish to make a "positive" cast to appear like the true footprint. Once more place a form about the raised plaster track. Plasteline, clay or mud may be used to make this new retaining wall.

Preparing the Cast.

Before pouring the liquid plaster into the mold, it is first necessary to place a protective covering over the original cast so that the fresh plaster will not "stick." Vaseline, or oil, may be spread over the entire surface of the cast in a thin film.

Stearine is also useful for this purpose. Once more we listen to MacDowell, "Cut up one-half a cake of strong soap and place it in a jar. Then add one-half a glass of water. Shake this mixture until the soap is nearly dissolved, the idea being to get 'watery' soap and not 'soapy' water. Now add one-half glass of kerosene. When this mixture is shaken up, the resulting emulsion should be a bit thicker than soft soap.

"Wet the cast with water and apply a very small amount of stearine (or vaseline or oil) using a soft brush.

"Now pour in the plaster and when it has set to a semi-hard state, remove the walls and trim the edges, taking care not to separate the two casts until the positive is quite hard. If the two are inclined to stick, place a knife in the joining crack and tap the blade gently."

It is a good plan to shellac the finished casts.

A good book about tracking has been written and illustrated by Leonard Roselle, its title is, "Tracks and Trails." It may be obtained from the Boy Scouts of America at One Park Avenue, New York City.

CHAPTER FOUR

SACHET EARNS A VACATION

"I respect the skunk as a human being in a very humble sphere."
—HENRY DAVID THOREAU.

HEARING an unusual sound on the footworn, wood platform, we hurried out of the camp entrance to discover a little ball of black and white fur lying motionless upon the floor; we were also greeted with a peculiar but familiar odor. Down the winding road, around the elbow of the lake and out of sight toward Tuxedo, sped an open automobile. It was engulfed by the wooded hills before we could see the lone driver who had paused at the camp barely long enough to toss out the furry ball. Was the small creature dead? At first we thought so, for it had landed upon the boards with a cruel enough bump. In my cupped hands it lay limply for a few moments, and then, very faintly, I felt the beating of a tiny heart and knew that I held a living creature!

A group of curious and somewhat anxious boys crowded about and stared at the motionless animal. Questions began to come thick and fast.

"What is it?"

"Is it alive?"

"What are you going to do with it?"

"It is a 'wood pussy,' a baby skunk," I answered. "Someone may have run over its mother on the road and then have decided to present our camp with the orphan."

Immediately, several grimacing boys, with noses held firmly between thumb and forefinger, vanished. Had I called the small animal by any other name than that of "skunk," they would have lingered on. The other boys backed off a little. They, too, were wary, but their thirst for knowledge overcame the power of suggestion tugging at their heels.

All of this excitement was not at all good for the young skunk. In the seclusion of my small room, I made plans as to what was to be done for our motherless infant. A cup of milk was secured from the cook, and with the greatest of care, we tried to feed the black and white one from a small spoon. But it was not to be fed. Without opening its eyes, it turned its head away and refused to eat. We were in despair.

The robust cook, who for ten months of the year fed boys at a large boarding school, was a good natured soul with little wrinkles at the corners of his eyes. He liked small boys very much. Indeed, all animals interested him. To him, we took the skunk. He had not the slightest idea of what sort of animal it was. The name, "wood pussy," completely satisfied him. Shortly a cup of warm milk was at hand, and a fountain pen filler or medicine dropper had been secured. After the ink was thoroughly cleaned out, the instrument of forcible feeding was ready for use. But the little animal persisted in its hunger strike. Its mouth was held stubbornly fast and it simply would not pay any attention to the dropper. The cook had been standing silently nearby with an amused expression in his eyes. Suddenly he commanded, "Get me a piece of string!"

This was done at once. The string was soaked in the milk and offered to the baby, which, almost without hesitation, began to suck the warm milk and continued to do so until its little stomach was round and full!

Everyone in camp was happy. The "wood pussy" would live! For the next two weeks it was fed many times a day on warm milk sucked from a piece of string. A box with a wire top and a soft floor was provided and for a time we kept the new pet indoors. It was a very whimsical creature and soon became very tame, allowing us to pick it up at any time and to stroke its soft, beautiful fur. Sometimes, at night, when I was trying to write on the desk before the window, the young skunk would play about in the happiest way imaginable. Hiding behind a pile of books, it would slowly show its head, cat fashion, around the corner and, making a clumsy sidewise dash, would knock the pencil from my hand. Again, it would whirl around, stand upon its front legs, and actually walk for a short distance, like a true woodland acrobat.

During the summer season seventeen skunks stayed with us, but none of them were as great favorites as the first. When the problem of a name arose as it always will, one of the camp visitors suggested that "Sachet" would be as good as any. We agreed with him. From that day forward our skunk was known as "Sachet the First."

Just back of the main cabin, we built a nice large cage wherein our growing skunk family might be kept. The young ones occupied one side and their elders the other. It was decided to give more elaborate sleeping quarters to the babies. A whole day was required to construct a soap-box bungalow, with real shingles of various colors upon its roof. The box was painted, and, at the proper time, placed inside the cage. "Sachet" with two of his

Photograph by M. Peter Keane. Courtesy the Am. Mus. Nat. Hist.

THE MEAL ON THE PLATTER

SACHET WAS A WHIMSICAL PET

cage mates, "Chubby" and "Sam," inspected their new dwelling from the outside, then, very cautiously, they entered and walked about with their diminutive black noses in the air. After a thorough examination, out they came and proceeded to dig a hole underneath the house. They soon demonstrated that they preferred to live under, rather than in, their new abode! We learned something. Skunks will be skunks!

The summer was a happy one for all of the "wood pussies," even after the cook found out that they were truly skunks and not "kittens" as he had at first supposed. Their diet changed about this time, for, after the cook was disillusioned, it became increasingly difficult to secure warm milk. Bread, meats, and fruit formed the major part of their new food supply.

August came to an all too rapid close and the boys were leaving camp. We gave some of our skunks away. Eight boys returned to their homes with pets that were admittedly "different." "Sachet," however, remained with us. Often, after midnight, a beam of light from an electric torch would discover him sitting all alone on the top of his little house wondering, perhaps, what was in store for him. There is an air of sadness when camp breaks up. The grounds, the lakes and the buildings have a deserted, neglected appearance that tell one very plainly, that another season has gone forever; no more happy voices, snatches of song, or evening camp fires until another year. "Sachet" seemed to feel this spirit of sadness, too. As the days shortened the little

Photograph by M. Peter Keane. Courtesy the Am. Mus. Nat. Hist.
AN APPLE IN THE AIR

skunk, which had now grown considerably, remained in his hole, coming out only for meals; but more exciting times were ahead!

In Springfield, a Massachusetts city, there was to be held the Eastern States Exposition. The camp had now definitely closed and it was decided to send some of the animals, birds and other creatures, collected during the summer, to the Fair. With a frenzied clatter of hammers and a ripping of saws, cages were made. Soon, we were on the road with our station wagon, a veritable menagerie. Our companions were a pet crow, a number of snakes and other things, too; but most important of all was "Sachet," who peered from his box at the scenery as we rode along.

Always, when we paused to eat, some food and water was brought out to the journeying skunk. Several times people stopped to ask whether or not we really had a "tame skunk." It was a simple matter to convince them. While resting at an hotel on the Sound in New Haven, we were asked to stage a performance for the guests. It was on this day that the "round the world flyers" were returning to their starting point, and that "Sachet" was to lose part of his tail. Strange to say, both of these seemingly unrelated incidents had a very definite connection!

Just as we were about to exhibit our pets out on the broad, grassy hotel lawn, some one shouted,

"Here they come!"

In a moment our spectators rushed down in a throng to the beach just in time to view the aeroplanes completing their last hop of the first air journey around the world. Our exhibition was delayed for at least fifteen minutes and the animals became very restless. When the spectators returned, "Jim," the crow, was stalking about the lawn and "Sachet" was running about in circles, inspecting every inch of the ground.

"Jim" was a jet black bird who loved white things. He seemed to be attracted by opposites, in color at least. He delighted in picking up white paper and buttons and then tossing them away with a quick twist of the beak only to return to them and go all through the performance again. As "Sachet" wandered here and there, he gradually circled nearer and nearer to the large, independent crow, which began to take a decided and presently an active interest in that little, white-tipped tail. When "Sachet" was only a few feet away, "Jim," with his wise head cocked to one side, stalked boldly over, and, with a sudden sharp thrust, secured the white tip in his powerful beak.

The audience fairly gasped. They plainly expected to see the finish of that crow then and there. To everyone's surprise "Sachet" at once began to run, dragging the crow along until, suddenly, a large portion of the white tip at last belonged to the crow who received the gift so quickly that he fell over backwards. History was indeed made on that day! "Jim," thoroughly disgusted, resumed his dignity and walked off bearing his trophy, making soft, throaty noises as he went.

Soon, we were on the bustling fair grounds at Springfield, where everything was topsy-turvy. Only three days remained before the opening and everyone was working night and day to complete his exhibit. All through the night the air was filled with the bellow of nervous cows, in places new and strange. An agricultural fair is a place of excitement! Sheep, goats, ducks and geese and almost every other conceivable creature that ever graced or disgraced a farm yard were there. "Sachet" seemed to be the only silent animal of them all. Instead of being upset by the furor, he curled up in a corner of his cage and calmly drifted off to sleep, a figure of peace in a field of turmoil.

The newspapers, when once the gates were opened to the public, were much impressed with our collection. "Sachet," the "pet skunk," was photographed and even cartooned! Overnight he became quite famous. In fact, so many people came to see the "tame rattlesnake," the "educated crow" and the "playful polecat" that there were times when it was necessary to block off the entrance to our hall until the crowd, already inside, had been dispersed.

From Springfield, we went on to Brockton, Massachusetts, where a still larger and in many ways a more adventurous Fair was about to give and sell itself to the people.

In this city, there was a hotel clerk who objected to having a skunk in his building. He peered sternly over the counter, saw "Sachet" through the wire top of the cage, and recognized him at once.

"No, sir!" said he. "I'll have no skunks in this hotel!"

In vain we argued with him, for it was late. We tried to show him what a serious mistake he was making. From his vividly descriptive conversation, we learned that "Once upon a time" he had been sleeping in a cabin out in the woods and had

been awakened by a noise. Upon investigation, he discovered a black and white animal enjoying forbidden supplies. The creature was small and the man's foot was large. Not being a student of natural history, he kicked the animal out of the door. He did not sleep well for several nights afterward.

"You can't stay here, that's final!" he shouted.

Well, there were other hotels, and so on we went. This time, however, "Sachet" was tucked safely away in the providentially deep pocket of a large raincoat.

Eventually we secured a room and were soon in bed. But night time was "Sachet's" daytime, and he was to be heard, pattering about the floor until we fell asleep.

Two days later the Fair opened with a blast of cornets and a crash of drums. Again "Sachet" was a center of attraction. People wanted to know all about him; wanted to pet and to hold, and above all, to feed him. Surely, that was a skunk which was not maligned!

When exciting things happen upon a fairground, there is seldom much of a warning. Brockton Fair was not an exception to this rule. One afternoon, in response to a fond parent's request that her little boy be allowed to hold "Sachet" so that he could say he had "touched a real live skunk," the little black and white animal was placed in the waiting arms. Then the boy was hastily left to his own contrivances, for something was happening in another part of the tent.

One of the harmless snakes, a big Gopher with shining bluish-black scales, had raised the cover of his cage and was escaping. It was over six feet long, the largest snake in the collection.

Some five hundred people were in the tent. In order to avoid a panic, the snake was taken entirely out of the cage and exhibited, as though that were a regular part of the show. The

Photograph by M. Peter Keane. Courtesy the Am. Mus. Nat. Hist.

"THERE IN THE CENTER OF THE ROAD WAS A SMALL BOY HOLDING SACHET"

spectators became interested at once, for nothing in the animal kingdom seems to attract more attention than a snake. In a short time the tent was quiet; the people heard of the habits of the snake, and of its harmlessness. A lecture was asked for and in this other snakes were exhibited.

When the talk was well under way, a commotion arose near the tent, outside. Quickly the snakes were returned to their cages. As the crowd inside was too compact, it became necessary to raise a tent flap and thus reach the scene of disturbance.

There, in the road was the small boy holding "Sachet." The youngster, who was in the center of a large crowd, was crying as though his heart would break. He had been under the false impression that the skunk had been given to him for all time. Despite the protests of his parents, he had somehow pushed his way outside the tent with "Sachet" in his arms.

Gently, the skunk was taken away, and an equally gentle effort made to stop the boy's crying. This last attempt, however, was quite unsuccessful. He wanted the wood pussy; nothing else would do. Thus he went away a sad but wiser little boy.

On the way back to the tent, some women were encountered who were very evidently looking for immediate assistance. They had been operating a demonstration counter under canvas, not far away. From what could be grasped, it appeared that they were being rather seriously annoyed by some firemen who had just finished parading and who were much under the influence of fire water.

Without pausing to put the skunk away, we accompanied the women to find four bold firemen trying on housewives' caps, for such were the goods on display. The men wore resplendent red coats with shining brass buttons. They were four and strong. We were two and weary. Suddenly, however, like the cook, we

had an idea. Placing "Sachet" upon the floor of the tent, we retreated to await results. The situation was left entirely to him.

The largest of the firemen was the most heavily overcome and the first to see the skunk. With an inarticulate gurgle in his throat, the champion grasped his nearest neighbor and in a moment all of the fire fighters were gazing, horror-stricken, at the little black and white animal, who was unconcernedly examining the floor. Then, as though propelled from a gun, the men rushed for the door with their arms held over their eyes. The women were annoyed no more.

There are probably not many skunks who have gazed, rather more impudently than otherwise, at the Governors of two states.

Photograph by M. Peter Keane. Courtesy the Am. Mus. Nat. Hist.

SACHET AND COTTONTAIL

During the summer, "Sachet" had seen and in return had been examined by the Governor of New York State; and during the last day of the Brockton Fair, he looked unperturbed at the Governor of Massachusetts. All people were alike to him. He seemed the most independent little creature that ever lived. Even when fishing for apples in someone's coat pocket, he would never hurry. Later, when he acquired the bad habit of chewing things he had no right to chew, such as dogs and human fingers, he took his time and would not show any particular interest in what he was doing, even though the object being "chewed" often did.

After a most strenuous week, the Fair was at last over and the journey home seemed to be the next thing. But such was not the case. There had been a man on the fairgrounds with a large dog with which he used to hunt and kill bears. The man made Indian bows, yes, and arrows with hand-chipped stone heads as well. When the Fair was over, and almost all our animals and other things had been shipped home, this man invited us to come with him to his home up in the center of Maine.

Thus it was that two days later we were in Boston, en route to Bangor, with a suitcase full of snakes, a tame crow, and "Sachet."

The boat for Bangor was a good-sized steamer called "The Camden." We had a little stateroom to ourselves and after all, there were enough of us to deserve at least two staterooms. The crow had been smuggled aboard in a suitcase, the skunk in a coat pocket, and the snakes in another bag. When once the stateroom door was locked we read:

"DOGS AND CATS, OR PARROTS,
WILL NOT BE ALLOWED IN THE STATEROOMS
OR SALOONS OF THIS STEAMER."

We were glad indeed that this notice had nothing to say about skunks, crows and snakes, for then we should not have felt that we were doing what was perfectly fair and square. Nevertheless, we smuggled our pets off the boat in exactly the same manner that we had helped them on. Vacation time had come. "Sachet" had earned a rest.

CHAPTER FIVE

ABOUT THE BEAVER

"The more we study the beaver, the more we are amazed at their remarkable intelligence and forethought."

—A. RADCLIFFE DUGMORE.

In two of the preceding chapters we have made bare mention of Beaver. We have approached the shores of his pond only to have him disappear into succeeding complexities of the black, beckoning type which spreads onward upon the pages to a consideration of other matters. I have spent many long, happy, and, in some instances, exciting hours in Beaverland. Somehow, I never can resist the temptation of talking about this animal, to me, the most important and fascinating of our American wild folk.

OUT upon the little pond, far back in an aspen bog, a "V" shaped ripple moved over the water's surface. Suddenly, there was a loud splash!—that was all.

"Beaver!" said the Indian guide, pausing to watch the ripple fade. "No more of him, today, wise animal—the wisest in the world!"

Almost everyone who has observed the American Beaver, in his native haunts, would agree with the Indian. The Beaver is intelligent! In fable and story, from the very earliest time in

North America, the Beaver has been widely known. The Hudson Bay Company traded for a time almost wholly with its skins, which were used as currency. Scientists have discovered that, many thousands of years ago, Beaver, the size of our present day Black Bear, lived and flourished. Today, however, with encroaching human population, the unfortunate animal has been forced to live upon the frontiers of civilization. Although the tribe has been sadly depleted, there remain a few isolated colonies which may be observed by out-of-door people. Within fifty miles of New York City are several active beaver homes which may be seen from the state highway. The animals are under the protection of the Palisades Interstate Park Commissioners, who have placed signs beside the road to call the autoist's attention to different watered areas. The signs read: "This pond is made by Beaver." Many thousands of tourists and campers have viewed these colonies with the greatest interest.

Beaver are the engineers of the animal world. They construct ponds, canals, and compact, dome-shaped houses. The life of a Beaver family is almost as full of romance as is the life of many a human being. It is replete with adventure, hard work, play and care.

In the Spring of the year, a tribe of Beaver, due to overpopulation, is often forced to rid itself of one or more of its members. Oftentimes, a young ambitious male will acquire a mate and wander off to go into the construction profession for himself. Following some ice-released little brook down into the fern-filled valley, where aspens or poplar trees grow, he will stake his claim. In a year's time, the small valley will be transformed. Where certain of the warblers and other forest-loving birds formerly found shelter, ducks and water birds will discover a newly

AN ADIRONDACK BEAVER DAM

formed body of water upon which they may float with ease and contentment.

As a small farmer's boy goes about deepening his pasture brook for swimming purposes, so does the Beaver commence his building operations. At first a small embankment of mud, twigs and sticks with here and there a stone, is placed across the brook from bank to bank. As soon as the water begins to deepen behind this breastwork, more mud and larger sticks are added until the protesting stream at length seeks to escape in some other place of less resistance. Wherever exploring fingers of the risen brook seek egress into the now weakened trickle below, our ever vigilant Beaver extends his dam, thus very effectively trapping the stream in every direction.

This process of constant erection is sometimes carried on until the dam has reached a height of three or four feet in the center and a breadth of two feet or so. In Alaska and elsewhere, dams have been found that exceed six feet from base to top.

In the pond's center, a house or lodge makes its appearance. This piece of architecture, mound-shaped in appearance, grows upward with the deepening of the water. Its interior is enlarged as the exterior increases in width and height. The front "door" or "doors," as the occasion may be, are beneath water, and lead, tunnel-wise, into a compact little chamber that is above water level. Often wooden splints or sherds of damp cat-tail form the bedding material. The life of the newly formed colony is then begun.

A pond serves the Beaver in many ways. It provides a medium upon which food and building material may be floated. In its depths, the builder may seek safety from prowling enemies, for like the distant Antarctic Penguin, he is clumsy on the land, but perfectly at home in water. This pond also makes his home

secure from all foes but the otter, by safeguarding the entrance beneath its surface.

In late afternoon and at night is often heard, at intervals, a loud scraping, gnawing sound upon the shore of a beaver pond. The sound continues until, at last, a crash tells the story of a fallen tree. Sometimes, however, trees do not fall, but rather catch in the tops of nearby neighbors and do not come down at all. In some lumber camps, farmers are employed for the winter season. When they cut through a tree and it fails to fall, due to the fact that it merely slips over into the supporting branches of another tree, the more experienced all-year-round lumber jacks sometimes whistle to call the "cow dog," thus deriding the farmer tree chopper. Whether or not the other Beaver similarly chide their fellows, no one can say. Nevertheless, the fact that this animal occasionally "lodges" a tree, combined with the fact that cut trees fall in every direction, disproves the theory that a Beaver can make a tree fall in any direction he wishes.

Chips that fall from this cutting process sometimes vary in size from an inch to five or more inches in length. On picking up one of these larger chips and holding it in the hand it seems almost impossible to realize that any animal could make so large an incision. As far as I have observed, only one Beaver works at a tree at a time. Sometimes he is "spelled" by another, but never do two Beaver work together at cutting.

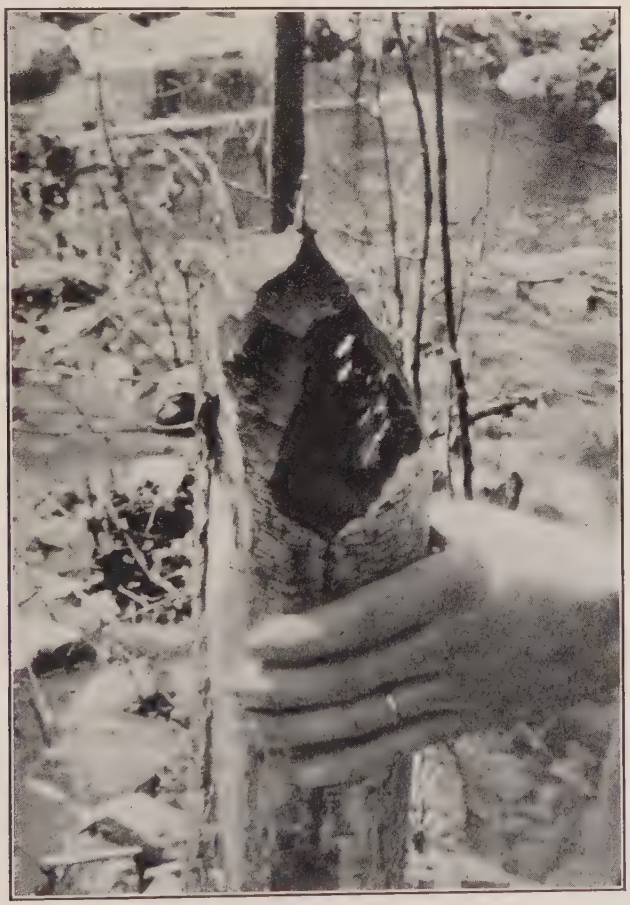
The food of Beaver consists of bark and aquatic plants. One of these animals feeding on the bark of a small branch reminds one of a piccolo performer. A stick is taken up in his small, monkey-like front "hands" or paws, and it is moved upward to the four, gnawing, yellow, pointed front teeth as the bark disappears. The whiteness of the denuded wood grows and grows until it is

A TREE HALF-FELLED BY BEAVER

thrown aside, shorn of every scrap of bark. These cast off sticks are used in lodge and dam construction.

As winter comes on, a food storage pile is formed beside the house. Branches and sticks, with bark still upon them, make their appearance, often above water. Their butt ends are buried in mud on the pond's bottom. When a thick sheet of ice later comes to shut in the dwellers of the mound house, they can secure food at all times by swimming out into clear, cold water beneath. They chew off a food section and then bring it into the home to be stripped of all nourishment. At times, when ice is thin and very transparent, these white sticks, secured as food, and floated out from the house, may be seen buoyed up beneath the glass-like covering. Sometimes, before the ice becomes too thick, Beaver

will keep an open hole both near the house and bank. They may thus continue the ceaseless lodge construction and, at the same time, feed upon bark obtained upon shore, even when snow has piled up among the tree trunks. In breaking a thin layer of ice, the head, shoulder, and, I am told, teeth of the animal are used.



A NEATLY-TRIMMED STUMP

"BEFORE THE ICE BECOMES TOO THICK, BEAVER WILL KEEP AN OPEN HOLE, BOTH NEAR THE HOUSE AND BANK"

In the stillness of a late Fall night, when a thin layer of ice is over the pond, a tinkle like the falling of fragments of glass may be heard, as a sturdy old Beaver comes forging from beneath to seek sustenance upon the bank.

How well I remember that frosty, November evening, when, with a companion, I sat beside a beaver pond upon the surface of which newly formed ice spread from shore to shore. No opening was visible. By being patient, I believed I might have the good fortune to see this ice breaking process. I waited and waited until it seemed my toes would surely freeze; and then, when I had decided to endure the cold no longer, I heard a faint motion beneath the ice.

"There he comes!" excitedly whispered my companion. "It's about time, too!"

Not more than thirty feet from where we shivered, we saw a barely perceptible, recurring bulge in the thin, relatively elastic ice. Suddenly, with a loud "crack!" the surface splintered and presently a slow-moving Beaver climbed cautiously into the reflected moonlight. I am positive, in this particular instance, that "chewing" played no part in his escape, for we could easily have heard the rasp of his teeth had he used them.

We watched the old fellow as he sat there dripping, and casting a long, ebony shadow across a mirror-like pond. His fantastic, slightly animated silhouette, framed by two birch trees, was a fit subject for the most striking of Japanese screens. Soon he moved and ambled clumsily over toward us. When he had approached to within about six feet, he stopped and experimentally sniffed the air currents. At this point, my friend, whose cramped position made continued quiet impossible, shifted a suffering foot and inadvertently snapped a brittle, dry branch. Instantly, the Beaver turned and dashed frantically for the ice hole. Twice during his brief journey, he slipped and spun along in a most ludicrous fashion. So great was his anxiety to reach safety, that into the opening he plunged without any preliminaries.

To "work like a Beaver" is a saying that has come down to us through the years. It is perfectly true that a Beaver knows very well how to work. At the same time, he also knows how to play. It is in late spring, and early summer, that the play instinct, if such it is, comes into its own.

The young "pups," some three or four in number, are then swimming about with their mother, who has, meanwhile, weaned them. Around and about they go, splashing and diving in sheer

delight. The old ones join in the fun and it is then that the serious side of beaver life is forgotten. At this time of year, too, there are Beaver who feel an apparent urge to "wander." They leave the home colony and explore various brooks and small rivers, feeding as they go. Beaver have been seen crossing desert spaces in their travels. It is at this time that scent "pats" are left here and there, as woodland "calling cards," to attract members of the opposite sex.

One of the most remarkable feats of engineering that Beaver accomplish is the digging of a canal. These water channels sometimes lead back from the pond for a hundred yards or so and may be gouged out to a depth of three feet. Canals of this type are usually made when food about the pond's edge becomes scarce. Food and building material, in the form of tree and branch sections, may be floated down and into the pond, by means of this waterway.

So many and varied are the accomplishments of Beaver, it is small wonder that numerous misconceptions as to their real ability have persisted, both by way of the printed page and by mouth. The very fact that a great deal has been generally known of the Beaver and its ways, seems to have resulted in many of these erroneous ideas as to its habits. The same thing is true of a well-known public character, or of a rattlesnake, for that matter. Both the rattlesnake and the Beaver are, in a sense, public characters. The family life of a great man is often misrepresented, as is the tail of a rattler! A very popular and widespread idea about the snake is that its age may be told by counting the rattles upon its tail. Despite the fact that a rattlesnake may add two or more rattles in a year's time, the false impression still remains—that each rattle denotes a year in age. So it is with Beaver. Perhaps the most extreme of these fables is the one of a tribe of Indians who be-

Courtesy the Am. Mus. Nat. Hist.

THE BEAVER SLAPS HIS TAIL

A Motion Picture

lieved themselves descendants of the Beaver, and who tell stories of inter-marriage between Beaver and Indian women.

The large, flat-ribbed tail that has aided the Beaver in many ways, for countless years, is an object of much controversy. It is used for steering in the water and as a prop for resting upon the land. It is also used like the tail of the muskrat, for the purpose of warning in time of danger. This is accomplished by the tail being brought down on the water with a resounding "smack" that may frequently be heard for half a mile or more. Oftentimes, though, a Beaver will splash when there is no danger, and others of his kind at work upon the nearby shore will pay no attention whatever to the sound. If they do heed the splash, off they rush to the water, seeking security in its depths.

I once rested near a beaver dam, in early evening, watching two young Beaver as they swam about in circles. On the shore, not far off, an older animal was feeding upon some small branches with audible gusto. A vine of semi-wild grapes straggled above me, and, following the parent Beaver's example, I, too, made a meal. The little ones splashed their tails constantly much as a human baby playfully will scatter water in the bath. Not once did the elder rodent pay any attention to this amusing behavior of her offspring. On another occasion, I observed a full-grown Beaver acting in a similar manner. I had alarmed him, yet he did not dive at once, but rather floated about, spanking the water again and again, in a nervous way, as though to express his displeasure at my presence and to insist that I go away. Though obviously disturbed, he continued swimming and repeated his warning, if warning it was, to other members of the tribe.

There are various observers who claim to have seen Beaver carrying materials upon their tails. However, no absolutely accurate proof of this ferry-like ability has ever reached me.

Another thing that the Beaver does not do with its tail is to use it for a trowel to pat down mud. If there is any mud, or sod "patting" to be done, the side of the head and fore feet are used to push and poke, rather than "pat." Grass, earth, stones, or similar materials are carried either in the mouth or in the fore paws.

One cold, windy December morning, two men and I set out, equipped to take motion pictures of Beaver in action. Two days before, as a direct result of a heavy rain, a most unusual condition had developed in the Beaver colony which was in the Palisades Park section of southern New York State. The beaver dam and lodge were situated on the inlet of a large, recently constructed, artificial lake, which had been made by building a concrete dam half a mile down the identical stream the Beaver had used. Since the completion of the man-made dam, the water had risen higher and higher until, at last, it reached and nearly covered the beaver dam. Then after two days and nights of rain, the State Warden informed us that the colony of Beaver had become flooded. The dam of sticks and mud was out of sight beneath water which had backed up against the distant cement structure. Thus was the home-keeping and daily routine of that local rodent family completely disrupted. The entire population, which amounted to two parent Beaver and four young, were practically drowned out. Temperature was falling fast and, in a short time, ice would form upon the lake's surface, making what would, in effect, prove to be an effectual barrier and form of resistance to new building operations that were so desperately needed. "What would the Beaver do to meet the emergency?" "How would they respond to the call of self-preservation?" These were the questions that we asked while we were walking the woods over the little trail.

The beaver lodge with about three feet of its dome above water stood out from shore at a distance of about fifty yards. It

looked very lonesome in the wide expanse of the larger lake that inundated the valley. Securing an old rowboat, we proceeded to make our way to the lodge. Water that splashed into the boat would freeze upon the sides, making them slippery and somewhat dangerous. We intended to move about the boat, but an ice-covered bottom made a more fitting place for ice skates than for shoes.

When the bow of our boat struck the house, there was instant activity inside. One after another, the startled inhabitants struck the water. Bubbles upon the lake's surface told of five swimmers bound for the far edge of the lake. Soon, heads showed above water and the Beaver swam about in circles, not more than thirty yards away. Occasionally one and then another would splash and dive, only to reappear again at some other spot. Being too far away to be photographed, it was necessary to devise some means of approach that would bring the swimmers within camera range.

Whenever the boat drew near an animal, he would immediately dive and swim away. After an hour of this hide-and-go-seek game, we became tired. The air had numbed us to the bone. However, we were out to obtain pictures, and pictures we were bound to get. Finally, the Beaver were tired, too. One of them returned to the house. Three of the more venturesome climbed out on the bank to rest. Once more we tried to approach, straight across the lake, fighting the rising wind as we went. Again we were disappointed, for the Beaver all plunged and resumed their swimming and diving tactics. Then we rowed right into the teeth of the gale, upstream, for a quarter of a mile and threw out our stone anchor. Our plan was to wait for the Beaver to go on shore and become settled again, then we would drift along to within camera distance.

After a time, the swimmers left the water and crawled cautiously out on the bank. Two of them were together and the third chose a spot not far away. This one, that was alone, to our delight commenced to chew upon the bark of a fallen tree. The anchor rope, which by this time was frozen stiff, was cut, and we started to drift, using one oar as a rudder to guide us. The camera's steel frame was so cold that, when pressed to the forehead, it fairly froze the skin. Hence a handkerchief had to be placed upon its frigid back. In a very short time, we were down almost upon the gnawing Beaver, who seemed not to have the slightest knowledge of our approach. As soon as the camera started to click, however, he turned, took one look in our direction,

BEAVER
This snapshot was made by a boy aged 12

and rushed for the lake. So fast did he go, that he failed to see a stump right before his nose. He struck this, head-on, and tumbled over, only to continue his dash. With a splash, he reached the water, slammed his tail in a resounding "crack" and dove. It was at least four minutes before he made his reappearance far out in the lake. Of course, the other two Beaver had discovered us by this time, and they, too, had gone out to join the lone one.

The short picture, that we suffered all day to get, now flashes across the screen in less than a minute. Nevertheless, it is now a satisfaction to see that frightened Beaver look around, rush without any damage to either party against the stump, and then dive into the water. Since that time we have taken many pictures of Beaver in action, but never have we worked so hard to get what we wanted.

Returning to the city, after our motion picture expedition, we could not but wonder what the ousted colony would do. Their home was gone, their winter food supply buried deep, and their entire efforts of the past ten months seemingly hopelessly wasted. Two months later, we again visited the lake. This time, there was a three foot layer of ice, covered with snow, upon its surface. Walking out toward the drowned structure, we saw some Beaver tracks in the very center of the lake. They led in a direct line to the shore opposite the old house.

There upon the bank was a new mound of earth and sticks. It was half in water and half upon sloping land. An open hole in the ice showed where the animals entered and left the lake. Freshly cut trees, nearby, had supplied most of the building material. In sixty days' time, in the very middle of winter, the Beaver had labored and constructed a home for themselves!

As we stood there, marvelling at the persistency of these so called "dumb animals," we suddenly saw a large brown form dive

across the little open space of clear water and disappear beneath the ice. The creature was headed straight for the hidden food pile, far out in the center of the lake. In exactly seven minutes he returned. We could see him clearly this time, for he was swimming slowly. In his mouth was a long slender branch with the bark still on it.

Thus were our Beaver obtaining food! Their previous work on the distant storage pile was not wasted after all. There were traces nearby that showed where hungry teeth had gnawed a meal from tree trunks. However, the original food pile must have supplied most of the sustenance for the winter. Later on in the season, some people were not satisfied with the amount of food that the Beaver were getting. They secured a wagon load of freshly felled poplar trees, and, chopping a hole in the thick ice, not many feet from the lodge, buried the load of trees in the bottom of the lake. Hence the Beaver would not have to swim so far for their food! All of this was a difficult task, but the satisfaction of worthwhile and kindly accomplishment was certainly worth the effort spent. Assuredly the lake dwellers were not friendless!

Major A. Radcliffe Dugmore has written two splendid Beaver books, both published by Doubleday, Doran and Company. The first is, "The Romance of the Beaver," and the second, "Two Boys in Beaver Land."

In 1868, Lewis H. Morgan wrote, "The American Beaver and His Works." This was published by J. B. Lippincott and Company of Philadelphia. It may be found in many libraries and is, perhaps, the best "all-around" beaver book ever printed.

CHAPTER SIX

MORE ABOUT THE BEAVER

WILLIAM T. HORNADAY *says of the Beaver:—*
" . . . His inherited knowledge, his original thought, his reasoning power, and his engineering and mechanical skill in constructive works are marvelous beyond compare. In his manifold industrial activities, there is no mammal that is even a close second to him."

I HAVE followed Beaver trails for many years and I agree, thoroughly, with Dr. Hornaday, whose statement heads this chapter. At the age of seventeen, or thereabouts, I visited this naturalist in his study in the New York Zoological Park, seeking information about Beaver. He listened patiently to my various questions, talked with me awhile, and then said,

"Sit right down! I have a book that will tell you what you want to know."

Walking over to a large bookcase, he drew out a worn volume and gave it to me, saying,

"Here is what you want. Just stay there and read it. Make some notes, if you want to."

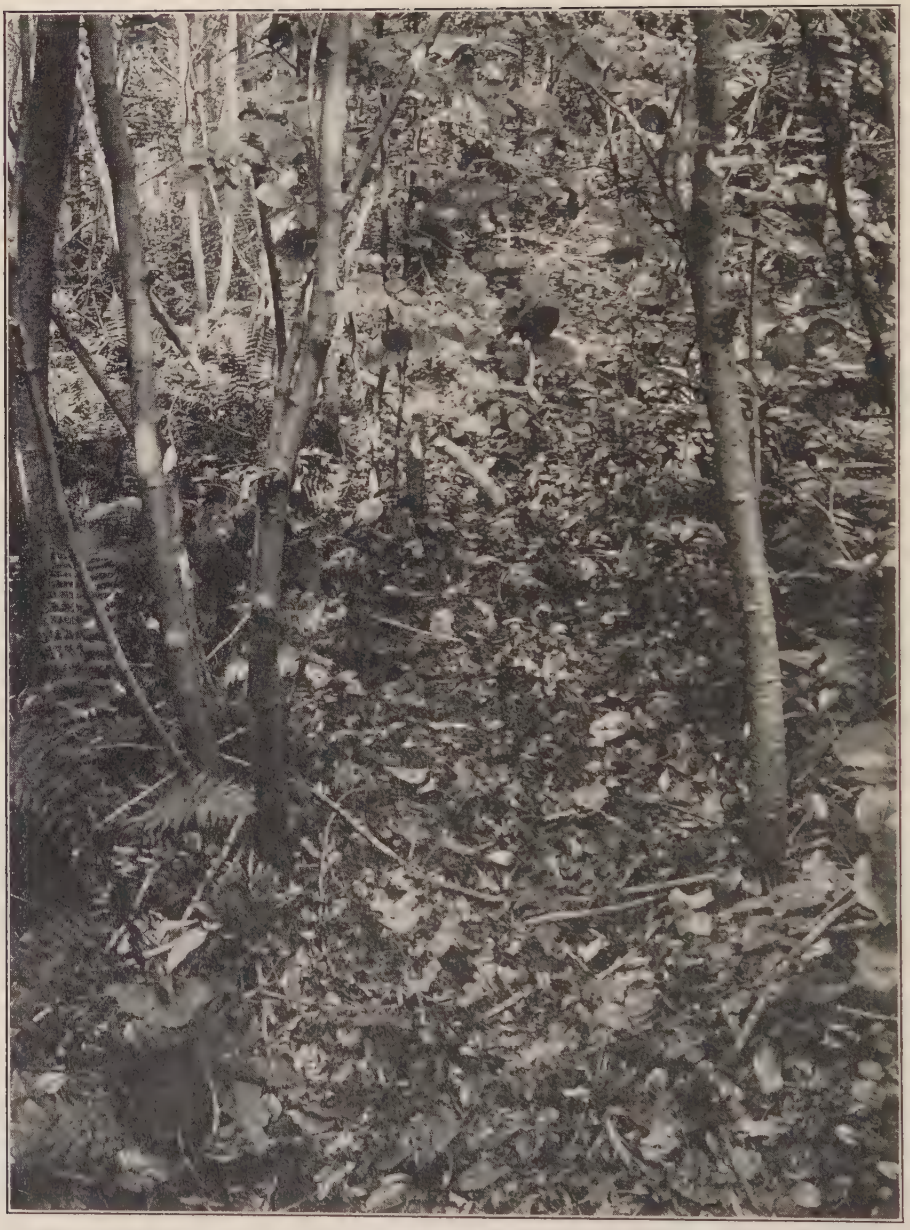
It was thus that I first became acquainted with "The American Beaver and His Works," by Lewis H. Morgan, and a most valuable acquaintance it was. If all of our naturalists, who hold high

office and whose opportunities for gaining knowledge are great, were as courteous and as enthusiastic as Dr. Hornaday, what a tremendous amount of initial impetus would many a young nature student receive!

I was interested, at that time, in finding some reasons why Beaver should be encouraged, rather than discouraged, in the Adirondacks. Nearly everyone with whom I had talked, deplored the damage to wooded areas, perpetrated by these dam-building rodents. They complained loudly about acres of dead trees, flooded highways and destruction in general. Many of these persons, however, did not look far beyond their own noses. They were extremely one sided in their arguments and did not recall those heroic days when Beaver colonies were scattered over nearly all of the United States.

In ages past, beaver dams formed reservoirs for large bodies of water in many parts of the North American Continent, from the Arctic Circle to what is now the Mexican border, and beyond. Perhaps the most valuable contributions from these Beaver of old are vast fertile meadows, which are a direct result of the rodent's activities. These meadows have provided many thousands of acres of ground of great value to agriculturists. In many sections, where these fields now exist, there were formerly rocky and unfriendly places, where the growing of plants would have been an impossibility.

Some ancient beaver ponds might really have been called "lakes," so extensive were they. As sediment found its way into quiet waters, it was gradually carried along and deposited evenly upon the bottom. With the increased age of ponds, considerable areas of water-covered, muck-filled valleys made their appearance. Some of the retaining dams were very high and were kept in repair over a period of many years. As a result of this, a great



A BEAVER TRAIL

deal of sediment was allowed to collect. When dams were neglected and the water receded, a flat even section of ground was left.

One Fall, in the center of the state of Maine, we found an old beaver meadow, miles out in the wilderness. Our guide called attention to it, otherwise it might have gone unnoticed, mistaken for a dried piece of spring swamp land. However, we walked to one end of the forest-bordered space and there noticed an even, raised ridge of ground, entirely marking one end of the area. A little, spring-fed brook had pushed its way through this barrier at apparently its weakest spot. Upon either hand were remnants of the dam in the form of cut trees and large branches. No doubt the brook had contributed largely to this old pond. Now, after many years, it was permitted to go its own way again, undeterred.

Labrador tea and tall grasses and sedges grew in abundance in many places. The tracks of deer and moose showed where they had been feeding. Harry, the guide, said that this was his favorite hunting spot. He told of deer and other animals that had been killed upon the meadows. Some fresh otter tracks were in the mud beside the brook.

During our long walk, we came upon several other similar monuments to the industrious Beaver, which had disappeared long since. We became familiar with the appearance of these meadows and grew to appreciate, more and more, the influence that these animals had exerted upon the general topography of the local country.

Present day beaver ponds are useful in various ways. A beaver dam, strengthened continually by the animals themselves, will often act as a splendid reservoir. Water collected in times of freshets will be held back and doled out gradually during

periods of drought. In this way, floods will be prevented, and dry spells will not so greatly affect vegetation in the immediate vicinity of the outlet stream bed. A comparatively even flow will be maintained throughout the year.

In some instances, washouts have been reported as a direct result of the breaking of a beaver dam. Road beds have been destroyed and tracks have been damaged. If only the Beaver had not been molested, the washout would not have occurred.

To keep the dam in good repair, it is necessary for the Beaver to work more or less constantly upon it. Small waterholes must be stopped or else they enlarge into sluice-ways. The level of the pond must be held at all costs. Constant stream flow, with its resulting pressure and wear, tends to tear apart the structure much more rapidly than might seem apparent.

Two over-ambitious photographers once discovered that by breaking a beaver dam they could secure pictures of the unfortunate animals as they came out to repair the damage. Day after day, for a period of two weeks, the men would tear a hole in the dam only to have the Beaver mend it during the night while cameras, with the aid of flashlights, took their pictures.

One, sultry, hot morning a large break was made in the center of the dam where the flow was the strongest. A real torrent threatened to drain the pond. That afternoon a terrific thunderstorm burst over the countryside. The rain continued to pour all night long. The next morning, to the amazement of the camera men, the weakened dam was rebuilt, almost as firmly as though it had never been broken! This incident certainly proved the fact that there, at least, was a colony that could maintain the water level even though the odds were great.

It is said by some that standing dead timber, in deserted beaver ponds, constitutes a potential fire menace. Of course fire

does start easily in dry wood; but, the truth is that timber standing in water does not often become ignited. If the Beaver are not disturbed, they usually see to it that there is plenty of water around their home. Under natural conditions, beaver colonies are not long deserted. Other rodent families are known to move in and occupy the lodge and to continue the dam work. Thus it is that ponds will seldom disappear completely. There is no great danger of fire, for the timber is not high and dry.

A study of existing conditions in the northern Adirondacks and in the Palisades Interstate Park has shown that, instead of being fire traps, beaver ponds are in reality protection against fires. They act as extensive fire-breaks, preventing the spread of fires started elsewhere. The body of water becomes a barrier over which fire seldom leaps.

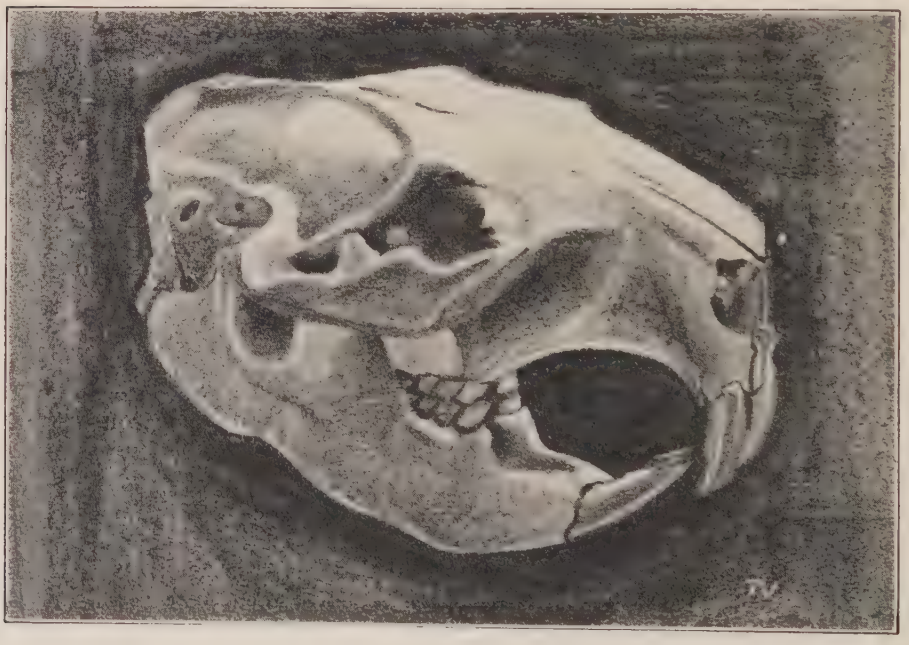
When discussing the harm that Beaver do by felling some trees and drowning others, it would always be fair to the animal to consider, also, some of the good that they are responsible for. It is often inconvenient to be forced to walk around a large beaver lake to get to one's destination in the woods. Nevertheless, it should be remembered that Beaver had access to the country long before exploring feet of Man tramped over the hills and valleys to the west and east.

Many creatures, other than Man, have discovered a diversity of uses for beaver dams and ponds. There are not many animals in the world who seem to labor for the benefit of others. The Beaver, in this respect, might almost be called altruistic. He toils, not alone for his own good, but for the good of others as well. Probably, however, this is no fault of his!

Muskrats make frequent and sometimes permanent use of beaver ponds. In one deserted pond, there stands a very large lodge that is now more than half above the dark water of the

swamp. Within the strong walls of this house, a muskrat family has been living for more than two years. They have inherited a large swamp to hunt in and will, no doubt, continue to enjoy their good fortune for some time to come.

Another instance of the muskrat's adaptability is shown in a larger beaver pond not far away. One Fall, a clever muskrat couple decided to establish themselves in this pond. They chose their site and commenced building operations at once. It was much easier to secure their materials from the food pile of the Beaver. Thus many delicate branches, that the larger animal had intended for winter use, were stolen and subsequently made their appearance in the muskrat home. At no time were the



THE BEAVER'S SKULL

Beaver observed, in any way, to resent the impudence of their near relatives.

Many birds have been quick to take advantage of the presence of beaver ponds within their breeding range. In recent years, many camps have appeared throughout the country from Maine to California. Numerous lakes, formerly occupied by birds, are now surrounded by encroaching tents and cottages. A number of birds have been forced to nest elsewhere. Black and wood ducks, the little green heron and the black-crowned night heron are among the birds to be discovered nesting near beaver colonies. The Louisiana water thrush and the pied-billed grebe have also found that good nesting places are there.

It would take many pages to enumerate the variety of plants, amphibians and insects that inhabit and thrive in and near beaver waters. Their tribes are many. One of the most characteristic plants to be seen upon older beaver dams is the beautiful Jewel-Weed. In the study of many of our northern beaver colonies, I have always associated the orange colored flower with the general environment of the animals. It would seem as though no pond could be complete without these brilliant flowers fringing the shore line and thriving upon the dam itself.

It was beside one of these dams, completely covered with Jewel-Weed, that I decided to camp during the summer of 1924. My friend and I spent two happy months there in a little brown tent which, for the fun of the thing, we called, "The Station for the Study of Beaver."

Nearby, a new beaver pond was being formed. This quiet little pool was separated from our encampment by a high rock ledge. The brook, dammed by the home making colony, farther downstream, ran directly by the tent. Practically every night,

for almost two months, the busy animals were subjected to a careful study. Many guests visited us and aided in the undertaking.

The Beaver had commenced their engineering late in the Spring. Having selected their site, they started to build a dam just above a place where the brook branched. Gradually the dam grew until its mud and branch walls extended across the brook almost to either side of the little valley. On July eleventh, the dam from end to end measured exactly seventy-five feet. Its height in the center was three feet.

One week later the Beaver had finished the first supporting dam. This subsidiary structure was erected to relieve the main dam of pressure. It extended across two branches of the outlet and succeeded in collecting water and "backing" it up against the main breastwork, thus effectively helping to lessen the strain placed upon the main dam by the pond.

Near the center of the pond a dome-shaped lodge appeared, growing larger and larger as the water became deeper. Many trees, including oaks, poplars, beeches and willows, had been felled, denuded of bark and used in construction. Only the stumps of these trees now showed upon the banks, for the Beaver is an expert forester. He leaves no brush piles to blot the landscape.

We kept notes of various happenings, day after day, and night after night. Here is a typical page from our "Beaver Sketch Book." You will see that not even the weather, the birds or the insects were beneath our notice. I turn the pages to "July 9th, 1924," and here is what I find.

"*Time*—6:30 to 11:45 P. M.

"*Weather*—Fair; light clouds in early evening, clear at night.

"*Remarks:* We arrived at our hiding place beside the

Courtesy of Le Roy Davies

IN A PATCH OF SUNLIGHT BESIDE HIS POND

pond and sat down upon a blanket for another night with the mosquitoes. It was two hours before anything happened. Then we saw ripples near the lodge, but no animals appeared. Nine o'clock two Beaver swam out. They circled in front of the dam twice, as though to make an inspection, and then the larger fellow climbed out and waddled slowly along toward me. He came on until about twenty feet away; then paused, leaned back on his hind legs, pulled down a poplar branch. and chewed it off. His supper lasted until every shred of bark had disappeared.

"Soon both Beaver were together again. One of them swam my way, presently, with a good sized tree, branches and all.

He climbed out upon the shore, cut off the branches and then, after having fed upon the bark, towed the stick over to the dam, where he pulled it out of the water and rammed it down into the outside breastwork.

"When it was about time to go, a young Beaver made his first appearance. He swam over my way, too. I believe he wanted to feed on a tender poplar branch near me, but was too suspicious.

"On the way to the second pond, I noted that, since last night, some four- or five-pound stones had been placed upon the upper surface. The entire face was built up about four inches higher than the previous evening.

"Note: Scared up a flock of about six black ducks on the way in; saw and heard the following birds: Black and white warbler, ovenbird, Louisiana water thrush, little green heron, phoebe, crow, robin, wood thrush, partridge and song sparrow. Also saw at close range, while waiting, cottontail rabbit and large raccoon. Collected some particularly large beaver chips and so to bed."

About a month later, on the fifteenth of August, the main dam was practically complete so far as height and width were concerned. It was one hundred and forty feet long and had risen to a height of four feet six in the center.

Two additional, reinforcing dams now supported the first. The lodge had been built to a height of nearly four feet above the pond's surface. By September, the winter food pile could be seen. This storage supply of the Beaver consisted of branches and trunks with the bark intact.

This brief sketch tells of what the Beaver accomplished. In the space of four months they had built a pond, a home and five dams of a total length of about three hundred and eighty feet.

Besides all this, they had collected almost enough food to sustain them during the winter. Just how they did all this work is quite another story.

There were but four Beaver in the colony, two large, and two smaller ones. The young animals did very little work. Usually the Beaver labored from seven o'clock until late at night. Early in the morning, several hours before sunrise, they again swam out from the house to work upon the dam or home. During the daytime they were inactive or at least slept or fed within the lodge. The average time for the Beaver's first appearance in the evening was quarter past seven.

During all of the hours that we watched, never once did we fail to realize that a large part of the Beaver's life was hidden from our eyes. Although we witnessed many incidents in the home life of these creatures, the picture was not complete; and so, whenever occasion permits, we revisit the Beaver, ever trying to learn something new of his ways. He always has a surprise in store for us, and we seldom leave the scenes of his activity without having gleaned more information as to his habits.

Two fine books, the first of a story type and the second of a naturalistic leaning, are:

"The House in the Water" by Charles G. D. Roberts, Page and Company, Boston; and,

"In Beaver World" by Enos A. Mills, Houghton Mifflin and Company.

Another book, written by a naturalist who has accomplished splendid work in the Yellowstone, is "The Beaver: Its Work and Its Ways" by E. R. Warren, published by the Williams and Wilkins Company, Baltimore, 1927.

CHAPTER SEVEN

JOE'S MICE AND THREE OTHERS

"Of mice there are many,
Their kinds are profuse,
We'd be lost without any
Yet we ponder their use!"

—ANON

HE day's heavy work was done and a quiet night settled upon our little lumber camp far off in the woods. All day long, the ring of axes, the crash of falling trees, and the cries of laboring men had filled the air. The cook and his boy, their duties over, left the dingle and joined a group of "jacks," seated about Joe's fire. Joe was an old, time-tried foreman whose knowledge of the woods reached over a good many years. In addition to this woods' lore, he was an excellent story teller. Consequently, almost nightly an appreciative audience gathered about to listen to what the old man had to say. It was my good fortune to be one of the group. On this occasion, even our two Polish loggers had left the bunk house. Although they could understand very little English, they nevertheless, would keep perfectly quiet and listen. There was something of a bit of woods' magic in Joe's smooth voice, and in his dramatic gestures, that sufficed to hold one's attention night after night.

He tended the fire for a few moments and then, everyone

comfortably seated, he permitted his glowing pipe to die and began to talk.

"While I was out, helpin' to yard some logs this mornin', I happened to kick over an' old, rotten stump—and out comes a little brown mouse. Afore I could move, off he shies into a pile a leaves an' was gone. Well, I had a bit a time, right then, waitin' for th' horses to come up, so I thought I'd hunt an' see if I couldn't git that mouse. Down on my hands an' knees I goes an' starts alookin'. At th' end a fifteen minutes, I was all tired an' hot, yes, an' mad! Th' ground behind me looked like some hungry black bear had been grubbin' fur ants an' had been pretty lucky, too. No sir! I never did come on to that mouse! If I hadn't seen him, I'd sworn, right out, that there wasn't a mouse in th' whole woods!

"That made me do a little thinkin'. Those scientists people, so I've heard tell, say that mice an' rats an' such, used to live on th' face a th' earth a long time afore we did. Well, that may be one reason they're so hard to find, now we've come along to wreck things gener'lly. Y'know—I often wonder about them small animals, livin' right under our feet th' way they do. It's a reg'lar world underground! We knock th' trees down, have been doin' it fur years, yet we don't know a thing about what's goin' on down below. The mice are great little fellers. They have to be on th' lookout all th' time. It's like a soldier in 'No Man's Land' lookin' fur enemies. Everything from hawks an' owls, down to snakes an' weasels feed on mice.

"One time I was up in Canada, runnin' some timber on th' St. James River. I remember we'd just rolled a pile a logs into th' water, when one a th' men gave a hoot an' I saw a whole family a mice in a nest on th' ground. Th' rollin' logs had uncovered 'em. I took off my hat in a hurry, you can bet, an' scooped up

that c'llection afore they knew what 'twas all about! It was a lot harder keepin' 'em in th' hat, than it was agettin' 'em; but I did it, anyway. I always was a good hand at catchin' things, too. A little time after, we climbed into th' canoe an' paddled down river to camp, me holdin' th' hat.

"Later on, we walked along toward camp an' I happen'd on an old powder box in some bushes. We stopped an' fitted it up good an' snug fur th' mice, so's I could use my hat ag'in. I sure needed it 'cause it was rainin' cats an' dogs! Mice like to sleep in th' daytime an' run aroun' 'bout their business durin' th' night. There was a man in camp who was sick. Somebody had t'stay up with him nights, so on this night, I said I would do th' sittin'. Well sir! believe me, I was more'n glad I had taken all th' trouble to git those mice. At first, I hadn't any ide' at all what to do with 'em. I caught 'em first an' thought afterw'rds. Sometimes, it's a good plan. Anyhow, if I'd stood by, waitin' to figure what I was agoin' to use them mice fur, I'd never have caught 'em, an' that's th' truth!

"Along about one o'clock or so in the mornin', I got up from beside th' bunk an' went over an' got my mouse box, an' set it on th' table 'longside a me. 'Twas very still then, only th' men's snorin' could be heard. I was kind a lones'me, sittin' there all alone, an' so, all night long I watched th' mice. Well sir, they ran all over th' box, explorin' every corner, tryin' to git out. Their little beady, black, pin eyes was wide open, an' their black whiskers wiggled back an' forth like a nerv'us ol' lady, acrossin' th' street! Sometime I'm goin' to find out just what good whiskers is anyway. They never did me no good; still, somehow, a mouse wouldn't look right without 'em!

"After awhile, I thought I'd stick my hand in th' cage an' see if I could pick up one a th' little fellers. Most people, when

they try handlin' wild birds an' animals, move too fast. I s'pose it took me as much as eight minutes to git my hand anywheres near them mice. I moved just as slow as a lazy horse apullin' a big tree up hill on th' end of a ten foot chain. Pretty soon, one a my fingers touched th' underside a one a th' mice that was sittin' on th' bottom a th' box. He didn't budge an inch an' didn't seem to pay 'tention to me at all. I moved up th' other three fingers, real slow like, until th' mouse was plum in my hand. Then I raised him up an' held him fur a minute or so. He didn't mind me at all.

"Well, we kept that family a little mice, ('twas th' mother an' three half grown babies, I judge), fur a week. Then we had to break camp an' I let 'em go off into th' woods ag'in. I sure had some good fun with 'em an' there wasn't any sense a keepin' 'em any longer. After th' fun I had with them mice, I've always been inter'sted in lookin' fur others whenever I could. That's why I made a fool a myself this mornin'. People make a lot of trouble about mice in their barns an' houses. Well, they wouldn't be there if there wasn't houses! Th' mice got along all right afore people began buildin', didn't they? You bet they did, an' besides if houses was made right, mice would keep out!

"It's just like th' barn swallows. They used to be happy enough, nestin' in trees an' other places afore there was any barns for 'em! Now people holler about 'em messin' up th' place. 'Most all th' trouble people have with animals is not th' animals' fault at all!

"An' say, any time one o' you men gets a chance to catch any mice, just bring 'em to me. I want a pair to see if I can raise 'em an' git 'em real tame."

With this request, old Joe arose from the fire side, knocked the cold ashes from his pipe and, with the remark, "Looks like a

Photograph by Mary C. Dickerson. Courtesy the Am. Mus. Nat. Hist.
"THREE HALF-GROWN BABIES"

good day tomorrer!" departed for his bunk. In a few minutes, I followed, only to find him sound asleep. Sitting down upon an upturned nail keg, I recalled several adventures with mice; experiences that I have always thought of as the *Story Of Three Mice.*

The first one came to me at night while I was encamped in a hemlock grove not far from the Hudson River. My lantern had been lit for several hours, and as it hung from the tent pole, streams of light shone out into the woods for a short distance, bordered on every side by blackness. Moths flew about and then alighted where their beautiful gray and brown wings showed

delicate traceries of darker colors. An occasional weary beetle literally dropped in, rested upon my blankets for a time, and then, after having flown heavily about the light, vanished into darkness again. A little brook that connected two beaver ponds made the only sound to be heard. It struggled about among rocks that a thoughtless glacier had dropped centuries before.

Suddenly there came a rustle in the dry leaves, outside. It sounded as though a careless dog were running through a field of dry grass or as though some larger animal was very deliberately approaching without the slightest attempt to be quiet. Placing my hat between the light and my eyes, I tried to see what the creature was. The sound ceased when quite near, however, and

Photograph by Mary C. Dickerson. Courtesy the Am. Mus. Nat. Hist.

"THE VERY SPIRIT OF THE FOREST, A WOODLAND JUMPING MOUSE"

not a thing showed itself. Then I had an idea. Taking the lantern down and placing it on the ground some twenty feet from the tent, I retired once more to see what would happen. Again the sound came, but now from a different direction. This time it did not stop, and into the lantern-light came jumping a mouse of about the size of a common house mouse. It hopped straight to the lantern. The inquisitive, nervous whiskers worked rapidly as the brownish animal stood there fascinated by the glow. Then, as suddenly as it had come, my little visitor turned and hopped away into the blackness. Several times I heard it, but I did not see it again for the rest of the night.

For a moment, the very spirit of the forest, in the form of an an elusive woodland jumping mouse, had shown itself, only to vanish once more and leave me to speculate as to its whereabouts. The forest floor in many sections is lined with countless tunnels and runways of many different kinds of mice. They spend their quiet lives unobserved and, in a certain sense, unappreciated as the timber foreman had suggested.

I wanted very much to get this little jumping mouse alive that I might photograph and further observe it. On the following night, I set a trap that was designed to catch animals alive. This done, I lay down at some distance to see what would happen. After a while, the sound in the leaves came again straight for the source of light, in this case a flashlight set in the rear end of the trap. A shadow was thrown into the woods as the mouse approached down the yellow path. Without hesitation, he entered, stayed for about a minute and then, to my great disappointment, calmly came out again and hopped off. The trap had failed to work. The mouse had seen, examined, and vanished!

Although I spent more than two months in the same woodland spot, I never saw or heard the jumping mouse again. Pos-

sibly the trap had warned it, or perhaps some marauding owl, on noiseless wings, had swooped down to bear it away for ever. Who may say?

The second "mouse experience" had, for its background, a little valley in the Maine woods many miles above Bangor. While traveling along on a warm autumn afternoon, my companion and I sat down upon a fallen tree to rest. We had not been quiet for long before a soft sound in the leaves announced the coming of a very small mouse with a darkish-red back. We kept absolutely still, and he came slowly on, walking down a rotten beech log. Every few moments he would pause, fold his tiny forelegs and stand up to look about. His nose and ears worked rapidly, trying to catch any scent or sound. What a timid, restless creature is the mouse! This little traveler advanced until he was not more than three feet from the long rifle barrel that lay harmlessly upon a stump. Many were the hesitations and indecisions on the little rodent's part before he dared venture any nearer. A squeak from my lips, however, somewhat encouraged him, and with a sudden dash and burst of courage he jumped upon the very log on which we sat, ran down it almost to us, and then, with a frightened subdued cry, leaped off into the leaves and disappeared down a nearby, tiny hole.

I wanted very much to capture him or at least to see his home. Consequently, half an hour later saw two men with dirt all over their trousers, and hands and faces, down upon their knees in the damp soil, digging away in the same manner described by Joe. Tree roots were cut, stones uplifted and dead trees shifted out of the way. Behind us an irregular trail of freshly-turned earth marked the extent of our progress. The tunnels branched in many directions, but we followed them all to their very end, only to return once more to the main passageway. Still no mouse.

Several times the winter's storage of seeds, the property of some thrifty chipmunk or mouse, was unearthed and investigated. At length, the hole ran up to and under a large boulder. There the quest seemed to end, but my guide voiced his ambition to go on regardless of obstacles. We cut down a small cedar, trimmed and smoothed it and then began the real work. Using smaller rocks and supports and chucks, we pried, turned, lifted, drooped and sweated above that rock for the better part of an hour until, with a mighty heave, we rolled it over to expose its undersurface to the weather for the next ten centuries or so. Then we began our search for the Red-back's nest, but in vain. The hole proved, after all, to be but a storage chamber. If I am not mistaken, I believe that that particular companion of mine has had his final mouse hunt!

Now we come to the last of the "three mice;" to the mouse for whom, of all others, I have the greatest of affection.

It was early in the Spring. The snow had just deserted the fields, and at last the gray and brown woods had commenced to decorate the country-side as they pleased. Already the grasses along the brook were turning green, and skunk cabbages were raising their heads in damp places nearby, and many new bird voices came from the fields and brambles.

While walking down a path not far from the brook, I saw what looked to be a red squirrel's leafy nest in the top of a beech tree, some fifteen feet from the ground. As a matter of course I seldom fail to take advantage of opportunities to investigate any animal's home I may discover out in the open. One can be as careful with an animal's residence as with a person's. It is just as unfair, and even more unsportsmanlike, to disturb the home of any wild creature, as it would be to do the same thing to one's next door neighbor.

I climbed the tree very carefully to the place where the squirrel's nest was. On reaching it, I gave the branch a slight shake and was very much disturbed to see the bundle of leaves fall to pieces and go scattering down to the ground. It was an old and apparently an unoccupied nest.

I was just about to go down when, in the place where the nest had been, something with small white feet moved. A little deer mouse, rudely disturbed, was trembling upon the branch. The old red chatterer's nest had provided a resting place, and the accident had left her uncovered.

In a moment, White-foot had run to the tree top. I climbed slowly up after her, for in my mind's eye, I had visions of a small pet that would live with me for some time. At last, when not more than three feet away, the little mouse turned and started down. Realizing that she could escape me in this way, I also descended hastily and looked for a small stick that would help me to keep the frightened one from getting away. My efforts were wasted, however, for I found in the tree next to me a helper that had come up most unexpectedly.

An excited little Chicadee, with black eyes flashing, came sailing straight up to the tree. Several times, during the subsequent engagement, he hovered and dashed so closely that I could easily have touched him. Without the slightest hesitation, he made several angry dives at my frightened mouse, and so alarmed her that she scurried back to her high post of observation. The Chicadee followed, scolding constantly, and flying at times with darting speed not more than an inch or so from poor White-foot's bewildered head. Surely that small bundle of worried feathers, the tremendously agitated Chicadee, must have had an ancient grudge against the mouse!

Finally, White-foot retreated to a topmost branch and then

came a rapid climax to the drama. When the mouse saw that no possible escape was offered by climbing higher, she quickly grasped the situation and, like a flash, came rushing down the tree. Stopping for nothing, she jumped over my useless hands, fell to the ground and whisked down a small hole in a dead Chestnut stump. Chicadee and I had lost our game.

Several months later, however, I was more fortunate in my endeavor to capture a deer mouse. This one, without any invitation, had made a nest in the corner of an empty bookcase drawer in my cabin. As soon as it became evident that a regular tenant had accepted my hospitality, I took pains to encourage her, placing food in convenient spots and helping in other ways to establish a better acquaintance.

At night, as I sat reading by the open fireplace, White-foot, a noiseless and thoroughly well-bred little guest, would run silently across the floor, dart under the bookcase and disappear for a time. She was merely a shadow in the dark corners of the room and, after a time, I grew to desire a better view. She was the only visitor to the cabin who had to be coaxed to give an account of herself!

I watched her comings and goings for many an evening until it became evident that babies were tucked away beneath the bookcase. Once, when she was out upon a foraging expedition, the drawer was opened very carefully, and there, sure enough, were four tiny, gray infants lying in a nest of hair and shredded paper! Their eyes were closed and not a sign did they make as we examined them.

How securely they were bundled together! It was necessary to part the paper with gentle fingers, before they came to view. The temperature in that small nest was considerably higher than

Photograph by Mary C. Dickerson. Courtesy the Am. Mus. Nat. Hist.

"WHITE-FOOT RETREATED TO A TOPMOST BRANCH"

Photograph by Mary C. Dickerson. Courtesy the Am. Mus. Nat. Hist.

A WHITE-FOOTED MOUSE'S NEST

in the room; yet the young ones slept blissfully on, not at all disturbed by the heat.

I waited for about a week, and then, certain that the little family would be grown up and that their eyes would be open, I quickly opened the drawer, found mother at home and, before she could escape, thrust a wire net over nest and all.

By moving very slowly and taking elaborate care not to shake the net, I transferred the entire family to a large, excellently made cage. For the space of twenty days, the mother and her children were observed, photographed and cared for. The babies were quite trusting in a short time and toward the end even that nervous mother permitted us to draw near without flying into a panic.

Finding the nest of a Red-eyed Vireo, I placed it, together with the branch, in one corner of the cage. Nesting materials were scattered over the floor and, on the following morning, the babies were all comfortably located in the bottom of the bird's nest. The mother, too, accepted this new home, having first made a cover for it with the bits of string provided.

Thoroughly satisfied with the opportunity to become intimate with the White-foot clan, I was only too happy to release them. Leaving the cage door open one night, I went to bed and when I awoke, my pets were gone—I hope to a friendly land where food is plentiful and enemies few.

CHAPTER EIGHT

DEPARTURE OF THE HERONS

"The heron nods. The charming runes
Of Nature's music thrill his dreams;
The joys of many Mays and Junes
Wash past him like cool summer streams."
—MAURICE THOMPSON.

I DO not like cheese! The reason is that I once worked in an ancient cheese "factory" which secured all of its mechanical energy from a very old water wheel on the St. Regis River. I say, "worked," advisedly, for my hours began at six in the morning and ended well after six at night. The antiquated water wheel was intimately associated with making our labor exceedingly difficult. It had revolved so many times, for so many years, that the spirit of youth had fled from its worn skeleton; and it would willingly have stopped altogether, except for that driving power of the relentless St. Regis, pouring down the flume, urging it on and on. The duties of this wheel were to spin a cream separator, run the butter churn, and turn a number of wooden wheels, of all sizes, from which ran creaking leather belts that constantly slipped off only to be replaced with ever imminent danger to life and limb.

The settled, aged, timber dam, which made our river hesitate in its onward rush just long enough to lend some of its force to

the flume and thus to the wheel, stretched from shore to shore right beneath our "factory" windows. For years a pair of Great Blue Herons, which flew up and down the river for a month or so each summer, had taken advantage of the mill pond. How well I remember pausing in my work when these graceful birds glided down stream and alighted anxiously on the dam. Often they would appear while I was walking around and around the big, steaming vat, stirring its contents of whey and curds with an ordinary, wooden, garden rake. Then, when I was aware of their presence or had seen their approach, I would put down the rake and watch. While waiting for the whey to drain off, I could usually walk out-of-doors for a time and observe the birds close at hand. The Heron, as a rule, is a wary bird, but these two were surprisingly tame and one might approach near enough to follow their movements easily. I never was satiated with gazing at them. They fascinated me, yet the business of following the everlasting cheese, through all of its various stages of production, would call me away. Indeed, Herons and Cheeses are very closely related in my mind, and no doubt always will be!

One sunny forenoon, thanks to an unlooked for holiday, I set off in my old row boat for a trip up the river. "Jimmie," an intelligent and faithful shepherd dog, who had been my companion on many similar journeys, went with me. As we pulled along, he sat in the bow with his head over the edge, peering ahead. "Jimmie" was a true hunter. He delighted in many a tussel with redoubtable woodchucks, and invariably came off the victor. With eyes and nose ever on the alert, he would search the shores of the little river and, when a rabbit or even a red squirrel appeared, would jump up, all eagerness, to be away and after it. I had to reprimand him several times, for he dashed about the boat in great excitement, making my task of rock

dodging none the easier. The St. Regis ran quite swiftly at this spot among many submerged boulders. As a rule, I liked to row up for a distance and then, using an oar as a rudder, drift down stream, again. Only in this fashion would there be time and opportunity to watch the shore line, perhaps stopping along the way to investigate anything which might interest me.

At one spot, a little island stood out above the water and provided a splendid, shadowy channel between the main bank; for both on the island and on the shore, tall spruce trees grew. The water was very cold, there, due to a constant trickle of spring water which slid over the mossy cliff-side in many places. We went steadily upstream, and just before clearing the island, I saw on a small sandy shelf my friend, the Great Blue Heron. He was posed upon one foot and I had to look a second time to make certain that it was a bird and not a dead tree stump. For some reason or other, "Jimmie" failed to see the Heron. I rowed as slowly and with as little sound as possible and, very gently, approached the motionless form on the sand.

When no more than thirty feet away, I paused to look. Almost the instant I stopped rowing, the Heron, with a sudden start, came to life and spreading its beautiful, long wings, sailed off across the river. "Jimmy," in the meantime, had been peacefully resting in the bow. When the large bird flapped into view, so unexpectedly, the excitement proved too great for the dog. With a startled yelp, he, too, awoke to action, and without any hesitation plunged into the water with a splash that thoroughly soaked my shirt. Of course, the Heron by this time was practically out of sight. The cold water dampened "Jimmy's" initial enthusiasm; yet he swam to the point, shook himself vigorously, and no doubt realized that he had played the fool. With a sorry, dejected air, but valiantly wagging his tail, he looked at me and

HE WAS POISED UPON ONE FOOT

seemed to say: "Well, we all make mistakes! Come, take me back in the boat, I won't do it again, honestly!"

I forgave him, and soon we were on our way. The Heron had merely flown around the river bend. Once more we drew near, only to have him repeat his spectacular leave-taking. This time, however, "Jimmy" simply stood up and made no attempt to dive. When the bird had again disappeared, the dog looked at me, very obviously asking for approval.

"Good dog, Jimmy!" I said. "Once was enough, eh?"

Soon, we reached the large rapids, where only a canoe could be used. It was the turning point of our little voyage. Just below the rapids, in a sheltered cove, was a large, deep pool. The exertion of rowing having made me very warm, I rested awhile, tied the boat to a projecting snag, and went swimming without the aid of any bathing suit. I have always enjoyed the water, salt or fresh, best, without any hindrance whatsoever; but, today, there are few places where one may swim alone in this natural way. This little pool in the St. Regis was miles away from any farm, and so, for hours, one could swim or rest in the sun to his heart's content without any fear of offending any human eyes.

There were many eyes other than human, however, which watched as I splashed about. An inquisitive blue jay flew down and scolded me. A red squirrel, perhaps attracted by the jay, chattered away from the top of a neighboring pine; and generally, all of the less timid woods people came forth to view the strange, sun-burned "fish" that sported in their river. "Jimmy" joined me in my swim and enjoyed to the full that quiet, afternoon bath. Presently he landed and vanished into the woods in search of other adventures.

After a time, I swam ashore, dressed and walked slowly to the woods in the direction of the musical rapids. Just before parting

"DOWN IT WOULD COME LIKE A FLAIL"

the branches of a cedar tree, many of which bordered the shore in this particular spot, I saw the same big Heron come sailing down the river, to land in a marsh not ten yards away. As it was clear that he had not seen me, I lay down on the ground and watched him.

I suppose there are few birds more dignified in bearing than the Heron. This one stalked along, looking now to the right and now to the left, pausing and standing for a time like a statue and then striding on again with level head, apparently gazing into the distance. Suddenly, the long neck, as though electrified, would come into violent motion, down would go the head and, in an instant, there would be one less frog in the world. That keen, pointed, spear-like bill would impale the victim so quickly that one could scarcely follow the action. As I lay there, watching, I suppose the Heron speared at least five frogs, and each time he did it, I was totally unprepared; for one moment, the head would be in repose and the next, down it would come like a flail. "Jimmy" finally located me and succeeded in alarming the Heron at the same time. Thus ended my observations for that afternoon.

One early morning, after the last farmer had driven up to the weighing stand with his milk cans, while the separator was running merrily, sending out two white spouts, one of milk and the other of cream, I looked through the morning mists arising from the river and saw one of the Herons standing on a point of land that abutted the dam. I had never previously spoken to any of the other men about my Heron, but, on this occasion, he was so near and seemed so beautiful that I pointed him out to one of the workers. For a while the man stared, and then, without a word, he walked from the room, leaving me to my work.

In a very short time, a rifle was discharged just outside the

building. The explosion reverberated with sickening violence as its echo went crashing up the valley. Jumping to the window with a pail in my hand, I was so startled and angered at what confronted me, that I stood as though frozen. I was sure the Heron had been the target, although I could not see the gunner. For a moment, it seemed that I was mistaken as the powerful flyer surged bravely upward over the mill pond, but then, very gradually, as if suddenly weary of the air, the sturdy wing beats grew feeble. All at once, the broad wings drooped, sending the unfortunate wanderer hurtling down into the water with a cruel splash.

Dropping my pail, full of milk, I ran out in time to see the man with his rifle barrel still smoking, disappear in a side door. Rushing up to the dam, I looked down and there was the Heron floating at my feet.

All of this happened some fifteen years ago, yet, today, I can remember my emotions of the moment as though it were yesterday. There was one of the birds that I had seen for many summers, lying dead. I had always looked forward to its coming, had seen it fly many times, and had grown to regard it as a bit of the landscape. In fact we used to say:

"Well, it's about time the Herons came. I wonder who will be the first to see them this year?"

And, then, when the birds arrived, it was:

"The Herons are back!"

Now, all of this was over, for these were the only Great Blue Herons that we had ever seen upon this branch of the St. Regis.

I went back to the factory with a greater sadness than can be described. Even my anger for the slayer had subsided. He was a stranger who had only worked in the little plant for a week. In that land, and at that time, almost anything that moved fell

prey to the gun of the farmers. This fellow simply did not know, could not know, how much this bird had meant to me. In fact, as is usually the case, I did not know either until now that the Heron had gone. I suppose I should have attempted to give the thoughtless, criminal gunner a thrashing, but, somehow, I did not even seek him. Later on when we did meet, he said:

"Say, did you know I got that big Crane this morning? Sure, I shot him easy!"

At this my temper flew up. I do not recall all I said, and perhaps it is just as well I do not. At any event, when I had finished, the man, a heavy set fellow, did not know whether to fight or to admit his crime. He looked at me rather dully for a time and then said:

"Well, young feller, if I'd known you thought so much of that bird, I wouldn't a touched it. Why didn't you say something in the first place? You spoke too late!"

Ever since, I have always tried to speak first, yes, and I have tried to speak often, too! Of course, sometimes, it is of but little value to try to convince some so-called "sportsmen" that they are foolishly killing. Many times, however, the lives of birds could be saved if only those who know would "speak out in meeting" as it were, and decry the needless, stupid slaughter of many of our own native birds. When I think, that by merely telling that man something of the story of the Great Blue Heron, the bird would have gone uninjured, then, indeed, am I ashamed that I ever called his attention to a target, and stood by while he fired. Of course, I never thought that he would act as he did, yet how many times we recall the things we should have said but did not!

I could have told him that particular bird was not a "Crane" as he called it, but truly a Great Blue Heron, whose immediate kind were scattered far and wide over the western hemisphere;

who sometimes nested in colonies and other times, as with our river pair, were solitary. Furthermore, I could have told him that they were very scarce in our part of the St. Lawrence Valley. And now, the whole tragedy ended, if I could meet this man again, I would inform him that never since that fatal morning have I seen a Great Blue Heron at Allen's Falls. The female disappeared after her mate was slain and has to my knowledge never returned.

Now, in the year 1930, not only are the Herons gone and the man who was responsible for their going, but there is no longer any river at Allen's Falls! The old, and honorable cheese factory has fallen prey to vandals and to the elements. Even that water-

THE OLD MILL POND ON THE ST. REGIS RIVER

worn dam and flume are torn to pieces. Never again will the water wheel do its daily tasks. Its work has come to an end. The deserted little valley, with its dry river bed where once as a boy I gloried in the beauty of the country, is now sunk to a senile and depressing decay.

Some miles above, an enterprising electrical concern has built a great concrete dam and from the dam there runs, like a monstrous serpent, a huge iron pipe that twists and turns uphill and down, carrying all the water far around to a point a mile or so below. This depredation has been wrought so that the imprisoned water may generate electric power for the distant country-side. All of the land, between the dam and the place where the river is permitted to resume its natural flow toward the St. Lawrence, is barren and desolate. Even the beautiful Allen's Falls are dry! Without question, some of the farmers appreciate the aid that electricity gives. No doubt other cheese factories now run by electricity will enjoy greater and more simplified production; but, I, for one, will never forget the wonderful days when the friendly river flowed serenely on its way, making possible my boat excursions and my swims in cool, brown water. Nor will I cease to picture those two wild Herons, flying up the river, in the times when, for the magnificent sum of ten dollars a week, I dropped cheeses in boiling paraffin and held them up to dry; when I stirred the curd and whey and then, at night thoroughly tired, I paused to lean—but why go on? I am thankful for the wild spaces that are yet untouched. May they not decrease in size and number!

CHAPTER NINE

MANY FEATHERED STRANGERS

"Not only do our memories sometimes deceive us, but we really see nothing with exactness until we attempt to describe it."

—FRANK M. CHAPMAN.

STRANGE events do not always occur in strange places. Often the actors or characters are all that matter, for adventure is a thing that waits neither for time nor place. At least that is what we were thinking as we ran down the stairs and out to the front of the museum in response to suddenly acquired information. A boy had just stopped us in the hall.

"I saw something outside that looked like an owl," he said. "Will you come out and look at it?"

As we hurriedly left the building, our hopes were high. From the description, we were led to expect the very best.

There it rested upon the curled, iron grill guarding a large window. Over the fence we went and then, very cautiously, approached to within about ten feet. It was an owl and no mistake; a kind of an owl that was worth seeing! "Saw-whet" was its name. Its staring eyes followed us as we drew nearer.

Now this museum, upon which the little owl had chosen to perch, was one of the largest in the world, and it stood right in

the center of New York City. Inside the stone structure, there were many thousands of birds, but, alas, their toes had been turned up long since! Their skins, filled with alien materials, were reposing in eternal silence in innumerable trays and behind many square feet of plate glass. What a peculiar coincidence it was that of all possible places the Saw-whet should have chosen this particular perch!

We knew that others would be interested, yes, and very much pleased to see the bird, and so we returned to the museum and telephoned. Soon curators from four departments were assembled, gazing and talking. The stranger on the iron bar held the center of the stage. One of the greatest of living authorities on birds and, finally, the president of the museum were there, all paying homage to the woodland visitor. As the president remarked to one of the curators: "One touch of nature makes the whole world kin," and so indeed it did. Gradually the crowd drifted away and the photographer tried to secure a good picture of the owl. The best part of the story was that the Saw-whet, unmolested, later flew away with the good wishes of all concerned. In the heart of a great city, we were permitted as perfect a view of wild nature as the most sheltered of woodlands could have offered.

Years from this November twelfth, we would probably have forgotten all about this incident of the owl's visit except for one thing. That one thing was our journal. We took the pains to enter this record with the correct date. Here is the note.

> "November 12th, 1929. A boy brought me to an owl that was perched on a window grating near the entrance to the museum. It proved to be a Saw-whet, an excellent observation. Dr. Blank and other curators look at the bird with a good deal of interest. Dr. Chaper found a pellet and handed

A SAW-WHET IN THE CITY

it to Dr. Blank who turned it over to me saying—'Here, this is a part of your story.' The bird flew away during the night. A photograph was taken, but the light condition was very poor and I doubt if the picture will be of value except as a record. The Saw-whet is not so rare, but is seldom seen, for it is very little. It has been reported several times from Central Park."

This brief note told its story and, thanks to our journal, we will have the story after ten, yes, and thirty years have gone by. By keeping records of birds, one will eventually have, in addition to a personal "check list," a birds' timetable as well; for we will be able to judge when birds will arrive from the south, and when they will leave in the Fall. We will also know which of the birds are with us the whole year through. Written observations are of service to others as well as to the recorder.

Perhaps no living creatures are more concerned in the active observance of the calendar year than are the birds. The very existence of many of them seems to be intimately connected with the travels of the world about the sun. The marvelous stories of bird migrations, of journeyings of birds over seas and continents are known generally to multitudes of people. It has ever remained one of the great mysteries in the realm of animal life. In our study, it is always well for us to consider this question, for, though mysterious, our opportunities to know certain birds are absolutely dependent upon the fact that birds *do* migrate, even though we may not know why. Let us, therefore, consider a bird calendar or a bird timetable, so that we will not seek the Scarlet Tanager in January or the Northern Shrike in July. We will know when and when not to expect the various members of our bird families.

First of all we have the *Permanent Residents;* the birds that

are with us during all of the twelve months. It is a very good idea to become familiar with them for we may thus have a background or foundation upon which to build added knowledge. Here is a list that applies to the North Eastern States, particu-

Photograph by Lewis Walker
"MONKEY FACE," THE BARN OWL

larly to the region that lies within fifty miles of New York City. In Winter, Summer, Spring and Autumn these birds are to be seen. Several of them are very common and are easily approached.

Ruffed Grouse or Partridge	Bob-White
Red-shouldered Hawk	Red-tailed Hawk
Broad-winged Hawk *	Marsh Hawk
Duck Hawk *	Sharp-shinned Hawk
Cooper's Hawk *	Bald Eagle *
Screech Owl	Long-eared Owl *
Short-eared Owl *	Barred Owl
Barn Owl *	Great Horned Owl *
Downy Woodpecker	Hairy Woodpecker

* Seldom seen.

Red-headed Woodpecker	Flicker
Fish Crow	American Crow
Meadowlark	Blue Jay
English or House Sparrow (a foreigner)	Starling (a foreigner)
Purple Finch	American Goldfinch
Carolina Wren *	Cardinal
Tufted Titmouse *	Chickadee
Robin	White-breasted Nuthatch
	Bluebird

Of thirty-five birds, all Permanent Residents, you may be successful in seeing and finally knowing at least twenty. If you continue your interest, you may see them all. Some of the individuals, like the Robin and the Bluebird, are greatly diminished in numbers in Winter. The majority of their tribe go to the South, but some of the more hardy ones, probably those that have come from still farther north, spend the cold months here.

In the spring of the year, our country is visited by the greatest host of birds. Then, indeed, are the woods and the fields alive with song. The mating and the nesting seasons have come and the bird population is increasing. Northward go the ranks of the empire, in literal "waves," until those of us who frequent the out-of-doors meet new arrivals and old friends almost every day. The height of migration is reached. Those of us who have keen eyes and ears will find much to see and hear.

Among the groups of spring visitors are the birds that merely pass on to nesting grounds still farther north. These guests are *Transient Visitors* that will again be seen in the Fall on their way southward when the breeding season has ended. There are only a few weeks of each year when we may see these travelers. Therefore, if we know beforehand, the dates upon which these

* Seldom seen.

birds will arrive, we may be ready to make their acquaintance. They do not tarry long. Our introduction to them is all too brief. We must endeavor to meet and to know them, for we are truly fortunate in having the privilege of seeing them at all!

TRANSIENT VISITORS AND A TIMETABLE OF THEIR ARRIVAL FROM THE SOUTH

Pied-billed Grebe (March 24—April 14)
(Sometimes winters)
Blue-winged Teal (March 10—May 3)
Green-winged Teal (March 10—March 25)
Pintail Duck (March 6—May 3)
Canada Goose (February 14—May 7)
American Coot (March 20—May 5)
Wilson's Snipe (March 12—May 24)
Semipalmated Sandpiper (April 25—June 10)
Solitary Sandpiper (May 5—June 5)
Semipalmated Plover (April 20—June 5)
Yellow-bellied Sapsucker (March 25—May 15)
Olive-sided Flycatcher (May 10—May 30) *
Yellow-bellied Flycatcher (May 14—June 4) *
Rusty Blackbird (March 10—June 1)
Bronzed Grackle (March 10—April 4)
Acadian Sharp-tailed Sparrow (May 28—June 5) *
White-crowned Sparrow (April 24—May 26) *
Lincoln's Sparrow (May 2—May 24) *
Fox Sparrow (February 10—April 20)
Blue-headed Vireo (April 22—May 30)

* Not common.

Nashville Warbler (May 2—May 7)
Tennessee Warbler (May 10—May 14)
Cape May Warbler (May 10—May 14) *
Black-throated Blue Warbler (May 2—May 7)
Myrtle Warbler (April 17—April 25)
(Sometimes winters)
Magnolia Warbler (May 9—May 12)
Bay-breasted Warbler (May 10—May 14) *
Black-poll Warbler (May 10—May 14)
Blackburnian Warbler (May 9—May 12)
Black-throated Green Warbler (April 17—April 25)
Yellow Palm Warbler (April 2—May 16)
Wilson's Warbler (May 10—May 14)
Canadian Warbler (May 9—May 12)
Ruby-crowned Kinglet (March 25—April 12)
Hermit Thrush (March 25—May 16)

Along with the *Transient Visitors,* which stay with us for so short a period, come the birds for which our local country holds a much greater interest. These are the birds that come from the south to breed and to nest in our own locality. They may be called "Summer Residents," for they, too, leave us when their young have flown and the signs of Fall and Winter are to be found out-of-doors. These "Summer Residents" are of a great deal of importance to us. We may observe their nesting habits and may encourage their friendship over a considerable period of time. The mere fact that these birds have sought out our neighborhood for the express purpose of continuing the existence of their families brings us under obligation to protect them in every possible way. Truly their lives, as a race, are in our hands!

* Not common.

SUMMER RESIDENTS; WHEN THEY ARRIVE AND WHEN THEY LEAVE

Common Tern (May 1—October 15)
Wood Duck (March 10—December 1) *
Great Blue Heron (April 8—December 1) *
Little Green Heron (April 7—October 30)
Black-crowned Night Heron (April 1—August 30) (Rarely winters)
American Bittern (April 3—November 18) *
Least Bittern (April 27—December 1) *
Clapper Rail (April 3—December 5)
Virginia Rail (April 10—October 30)
Woodcock (March 15—November 15)
Spotted Sandpiper (April 20—October 1)
Killdeer (March 22—November 28) *
Mourning Dove (March 14—November 26)
Osprey (March 18—October 21)
Turkey Vulture (March 30—November 1) *
Yellow-billed Cuckoo (May 4—October 31)
Black-billed Cuckoo (May 3—October 7)
Belted Kingfisher (March 27—October 31) (Sometimes winters)
Nighthawk (May 6—October 10)
Whippoorwill (April 25—October 5)
Chimney Swift (April 19—October 23)
Ruby-throated Hummingbird (May 3—September 23)
Kingbird (April 25—September 15)
Crested Flycatcher (May 2—September 14)
Phoebe (March 14—November 16)

* Not common.

Least Flycatcher (April 25—September 13)
Wood Pewee (May 6—October 1)
Acadian Flycatcher (May 10—August 27) *
Baltimore Oriole (April 28—September 7)
Orchard Oriole (May 1—August 18) *
Red-winged Blackbird (February 19—November 15)
Purple Grackle (March 1—November 1)
Bobolink (May 1—October 10) *
Cowbird (March 10—December 1)
Swamp Sparrow (April 5—November 17)
Field Sparrow (March 15—December 1)
Vesper Sparrow (March 24—November 23)
Chipping Sparrow (March 28—November 23)
Rose-breasted Grosbeak (May 24—August 28)
Towhee (April 16—November 20)
Indigo Bunting (May 1—October 11)
Scarlet Tanager (May 10—October 1)
Barn Swallow (April 8—October 18)
Purple Martin (April 2—September 20) *
Tree Swallow (March 16—November 24)
Bank Swallow (April 20—September 14)
Cedar Waxwing (February 4—November 18)
Red-eyed Vireo (May 3—October 26)
Warbling Vireo (May 3—September 18)
Yellow-throated Vireo (April 23—September 23) *
White-eyed Vireo (April 29—October 1) *
Black and White Warbler (April 19—October 24)
Blue-winged Warbler (May 2—September 17)
Worm-eating Warbler (April 28—September 21)
Yellow Warbler (April 18—September 20)

* Not common.

Chestnut-sided Warbler (April 30—August 25)
Prairie Warbler (April 27—September 27)
Redstart (May 2—October 15)
Hooded Warbler (April 30—August 28)
Oven-bird (April 20—October 3)
Louisiana Water Thrush (April 8—October 2)
Maryland Yellowthroat (April 14—October 25)
Yellow-breasted Chat (May 5—September 6)
Catbird (April 27—November 1)
Brown Thrasher (April 2—November 3)
House Wren (April 14—October 18)
Long-billed Marsh Wren (April 8—October 20)
Veery (April 15—September 15)
Wood Thrush (April 13—October 15)

In the Fall and Winter, when the majority of our *Transient Visitors* and *Summer Residents* have flown away to an inviting southland, we feel as though our bird world were deserted. Gone are many of our songsters of the warm months. As we leave our summer cottages in the country and at the seashore, so do the birds leave us! The trees, at about this time, happily relieve our sense of loss by flaming out into all the colors of Fall. The quiet countryside is filled with striking beauty, and we turn to it for a while, marveling at its sheer loveliness. Gradually, however, strangers are discovered in the woods, especially when the leaves have fallen, and again we are visited by other troups of birds that have left the rigors of a more northerly climate to spend the cold months in our territory. They are *Winter Visitors,* most of which come to us toward the end of September and return to their northern homes in April. It seems as though they have come to relieve the emptiness of the winter woods and fields; to aid our faithful *Permanent Residents* in holding

Photograph by Clyde Fisher. Courtesy the Am. Mus. Nat. Hist.

A BABY LOOKS AT A HAWK

the fort until reenforcements arrive in the Spring. Here is a list of these *Winter Visitors.*

Herring Gull	American Crossbill †
Saw-whet Owl *	White-winged Crossbill *
Snowy Owl †	Pine Grosbeak *
Horned Lark	Northern Shrike
Junco	Winter Wren
Tree Sparrow	Brown Creeper
Pine Siskin †	Red-breasted Nuthatch *
Redpoll †	Golden-crowned Kinglet
Snowflake †	Lapland Longspur *

* Not common.
† Irregular visitors.

We have now divided our native birds into four groups:

I—The Permanent Residents
II—The Transient Visitors
III—The Summer Residents
IV—The Winter Visitors

All of this is but an aid to our study. The long lists of names are, to many of us, nothing but names! Nevertheless, it is hoped that they may serve to—

1—Help us realize the number of birds that we may see.
2—Give some idea of the types that inhabit our local world.
3—Provide a check list to be used by us in the making of bird notes.
4—Act as a bird calendar from which we may know, at a glance, when certain birds may probably be seen.
5—Give us an opportunity of making new records by adding to the old ones.

NOTE

The dates given in these "timetables" are by no means to be considered as "final." The arrival and departure of the birds follow no exact date. As different years vary in their seasons' weather, so do the birds vary in their flights. By keeping a careful note of the dates upon which you see birds, you may do much to add to our knowledge of them. Many of the rarer birds have been omitted from these lists.

A good book to read and to use for reference is one by Ludlow Griscom, called "Birds of the New York City Region," published by the American Museum of National History in 1923. This book was of value to me in compiling the dates and will doubtless give you a clear idea of the times of year when our bird neighbors journey back and forth.

CHAPTER TEN

AN AGENT WITH THE BIRDS

"'Early to bed and early to rise,' was another adage which I thought, and still think of much value; 'tis a pity that instead of being merely an adage it has not become a general law; I have followed it ever since I was a child, and am ever grateful for the hint it conveyed."

—JOHN JAMES AUDUBON.

THERE was a young man who believed, at one time, that happiness for him could only be found in knowing the manners of birds. Unexpectedly, he was forced to seek a position in order to earn a living. This was by no means a pleasant outlook, for nearly every one prefers to be employed at a task in which he has a real interest. The man who loves to sail the sea and who is a first-class sailor, does not belong on a farm or at an office desk. The sea is the place for him! Nevertheless, one must eat come what may!

After many disappointing and weary days of searching, the young man eventually secured work in the office of an Electric Lighting Company where he labored for two very long years as an "agent."

All of this might have been a tragic story, but for the fact that even a Lighting Company offers opportunities to learn

more about the birds. This particular company was situated in Jamaica, out on Long Island. It supplied electric current to light the homes of thousands of people who lived for miles around. Long, slender wires reached out of the city, across fields and marshes, clear to the shores of Jamaica Bay. These wires looked down upon many a beautiful scene in places where the wind often transformed them into humming, singing, aeolian harps.

The work given to the newly employed man, at first, seemed to offer few possibilities to observe birds. He traveled about, following the wire trails that led to cellars in buildings of almost every description. Had his secret desire been to act as a prohibition officer, his wildest hopes could have been easily fulfilled. Indeed, he found that the skeletons of many a house had left the attic in preference for the basement. The name "agent" was given to him as it was his duty to visit people in the various homes and either disconnect or reconnect the meters as new customers moved in, or as old ones moved out. Sometimes, he had to turn off the power in the homes of people who either would not or could not pay their bills. Many of these experiences were accompanied by excitement of varying degrees of intensity; but all of this is another story!

The fact is that the young man, interested as he was in birds, soon discovered entirely to his surprise that his lot was not so bad after all. His journeys took him to the Hollis Hills, the Queen's Meadows and to the shores of the salt water bay. All of these places had their bird populations. Thus, along with a compulsory training in human nature, there developed a voluntary training in bird nature!

Of course this agent was not paid a salary to study the birds! His business lay in dark, dismal and dirty cellars, where relent-

Photograph by Clyde Fisher. Courtesy the Am. Mus. Nat. Hist.
THE HERMIT THRUSH SITS TIGHT

less meters ran up electric bills for the consumers of the household. However, these cellars were a long way apart and the "meter man" found, that by carefully rushing his work and actually handling more assignments to the square mile than many of his fellow agents, he would have some time nearly every day to devote to the woods and fields that called him so irresistibly. He could keep the honest faith of his company and that of the birds, too! Invariably he carried a lunch, used his feet more than the trolleys, and Summer and Winter would be found at noon time eating out in the open and watching the birds.

One may learn a great deal about birds in two years. At least he may know how much there is to learn and will also understand something of what he *does not know,* which is most

important! The young electric light agent, for convenience sake, divided his territory into three parts so as to give his time to one section each day. This system was not only applied to the meters, but to the birds as well. The tree-lined hills gave cover to such birds as the thrushes, the woodpeckers, and the owls. The broad, grassy meadow lands, with bushes and shrubs here and there, sheltered the meadowlark, the sparrows, and the juncos. Gulls, ducks, sandpipers and rails were down near the shore of the bay where rolling hills of sand-anchored beach grass waved in the salt breezes.

Nearly every bird had its own favorite spot in which to carry on its never-ending search for food and for protection. Of course, at different seasons of the year, particularly during migration, many of them were to be found in strange places. In the Autumn, tree swallows might be seen in great flocks near the seashore, while in the breeding season, ducks might live in little inland ponds. In the main, however, birds live in well chosen places where they may regularly be sought by the bird enthusiast.

The agent was interested in finding kinds of birds that he had never seen before. He wanted to increase his "Life list," consequently he was ever on the lookout for strangers. As time went on, he found that in order to properly identify "new" birds and to study their habits, adequately, it was quite necessary to develop a method for earnest, useful observation. It was very much like the business of learning, quickly, how to know the points of information about electric meters. Each meter had its "serial number," its "maker's number," its "type number" and its "dial reading." There was a "seal reading," too! All of these things had to be correctly recorded and brought back to the office at the end of the day. One mistake could have caused much unpleasantness and trouble.

Now, birds do not have "serial numbers" or "maker's numbers" to aid in their identification. Nevertheless, they have other characteristics which are just as helpful. Each kind has its own private mark. The agent devised a scheme for focussing his eyes and his mind upon these marks—these time honored coats of arms. Though not very original nor complete, it was a great help to him in the way of providing definite objectives. He became forewarned and forearmed as he knew what to look for before he saw it! The following list is very much like his. It may aid in drawing your attention to certain things, too.

A. SONG: The songs of birds may often be a true "key note" in the making of their acquaintance. Bird voices are the musical accompaniment to the pageant of the trees and the flowers, to the panorama of the hills and the lakes and to the glory of the sunrise and sunset. They are almost as varied in character as are the colors of leaves in the Autumn. When we come to describe the notes of some birds, we are somewhat at a loss for words. We can only say that they are:

1 *Loud* or *low* as with the Flicker or the Junco.
2 *Short* or *prolonged,* like the song of the Meadowlark or the Red-eyed Vireo.
3 *Tuneful* or *unattractive,* as the White-throated Sparrow or the Crow. ("Unattractive" as an adjective to describe a bird's song depends too much on one's point of view! "Unmusical" might be a better term though I am not so sure!)
4 Sung from the *air,* as with the Goldfinch, from a *perch,* as with the Phoebe, or from the *ground,* as with the Pheasant.
5 The *season of the year* during which different birds sing is important to note. For instance, a Robin sings in the

Spring and the Red-eyed Vireo in the Summer. The early morning just after sunrise is the best time to hear the bird chorus.

6 The *Call Notes* of birds are not to be confused with their real songs. One should listen for individual calls of *alarm, scolding, signaling, fear,* and *warning.* Such birds as the crows have a vocabulary of call notes that would put a parrot to shame!

B. FIELD MARKS: The field marks of a bird have to do with its color, its size and form and, its *markings.* A field, or an opera glass will be of much aid in this study, but much may be learned without one. We will list these "field marks" separately.

1 The *form,* the outline or silhouette, of birds should always be observed. By this means, alone, we are often able to distinguish birds; to tell them apart even from a distance. The shape of the head and particularly the beak or bill, should be noted. The form of the wings, whether sharp, pointed, or rounded, long or short; the form of the tail, whether "square," pointed, or short, should also be remembered.

2 The *size* of birds is of course important to us in our effort to know them. By placing newly seen birds in size classes, we shall have decided immediately just where they belong in this respect, and our work of identifying them will be reduced a great deal. It is hardly possible to steal up to a wild bird and apply a ruler or a tape measure to it. However, we can quite easily know its approximate size if we will remember the figures "*6, 10* and *19.*" The Song Sparrow is about 6 inches long, the Robin 10 and the Crow 19. Therefore, if we are able to say that our bird is smaller than a sparrow, we shall know that it is less than 6 inches long. If its length is between that of a Sparrow and a

Robin, or a Robin and a Crow, we shall also know its length. These three size groups will prove most satisfactory when we consult a bird book for further information.

3 The *color* range of birds is almost unlimited. The beauty of color is only matched by song. Birds like the Scarlet Tanager and the Indigo Bunting are seldom mistaken for any other, if one has a fair view of them. These two birds, one of scarlet red, and the other of indigo blue, are never forgotten. The Yellow Warbler is another bird the color of which is responsible for the name. Not all birds are so distinctively painted. We have to depend upon where a given color may lie before we may know its wearer. The colors of certain birds change as winter replaces summer; the two sexes of birds are also different in respect to color. Thus to know birds by their color alone, a most interesting subject for study is offered us. If we are to be successful in it, we must learn to "see exactly what we are looking at." We must observe just where the various colors occur and thus we come to the *markings*.

4 *Markings* upon birds usually provide ideal means by which we may identify them. However, unless our eyes give us real service and tell us upon what part of the bird's body these marks are to be found, we will go forward quite slowly. We *must* learn to *observe accurately* or else our observations will be of little worth. If we will look closely at the body of some mounted bird or at a good bird picture, we will see that the creature has somewhat the same body parts as we have. Thanksgiving Day is a good time to study a bird's anatomy. A plucked turkey or a chicken will show us that a bird has "arms" as well as legs. It will reveal a "close-up" of the bird's rump, back, belly and breast. On the head we may see the "cheeks," the crown, the throat, and

the nape of the neck. By knowing these parts and by realizing that they correspond to the parts of our own body, we shall have a much easier time in telling just where a certain color occurs upon a bird in the field. The fact that a bird's body is so well covered with feathers, often confuses us and causes us to forget that it is "built" in much the same way as are the bodily structures of mammals.

It will not do to say, "I saw a bird that had white spots on its back and was brown all over." We must say whether the spots were all over the back or just upon the rump. We must also make sure that they *were* spots!

I once heard a boy describe a Bobolink as a bird that was black with a yellow spot on its head. After the boy was told how poor an observation he had made, he decided to try again. Several days later, he returned and showed that in a very short time he had truly learned to "see what he was looking at." He then gave us this description:

"A bird a bit smaller than a Robin, with a weak, yellow spot on the nape of its neck, underparts black, whitish on its rump and shoulders."

This was a very good description. We had no difficulty in telling the boy just what bird he had seen. When we showed him a picture he said, "Yes, of course, it was a Bobolink!"

These, and many more things, were learned by the Electric Light Company's agent, during his rambles through the woods and fields. One reason that he took special note of them was because he was an Assistant Scoutmaster in a troop of very keen Boy Scouts. Many of these scouts were anxious to pass their First Class and their Merit Badge tests in "Bird Study." Thus the "agent scoutmaster" had much to teach. He discovered that

he could learn more by teaching than he could by just learning! The birds, themselves, were his first teachers and the boys his second.

This agent had very little admiration for boys and girls, or for older people either, who merely wanted to be able to name a certain number of birds in order to pass a test or to be able to boast about the greatest number seen. His interest lay in observing the habits of birds, the year through. He felt that merely to name a creature was not enough, for to name is not necessarily to know! Real friendship with people means much more than simply a knowledge of names and so it is with bird friendships, too.

In order to know the habits, or the "life-histories" of birds, one must be on the alert for many things. Here is a list of details for which to watch if you would learn of bird habits.

USUAL HAUNTS. In making bird notes, and of course you must make them if you would be a bird student, you should take pains to tell just where the birds were seen. Were they in high ground, low ground, marshes, lakes, fields, rivers, seashores, woods or elsewhere?

ACTIONS. How did the bird act? How did it move about? Did it hop, creep, walk, or swim? Were its movements active, or slow? Did its wings flap as it walked, or did its tail wag? Many birds are decidedly characteristic in their movements. It is well to learn of these actions and see whether or not the same bird always acts the same way.

APPEARANCE. See whether the bird is "wide-awake," or alert; whether its crest and tail are drooped or erect, whether it is social or suspicious of strangers, or whether it is frankly inquisitive.

A KING RAIL'S REEDY PLATFORM

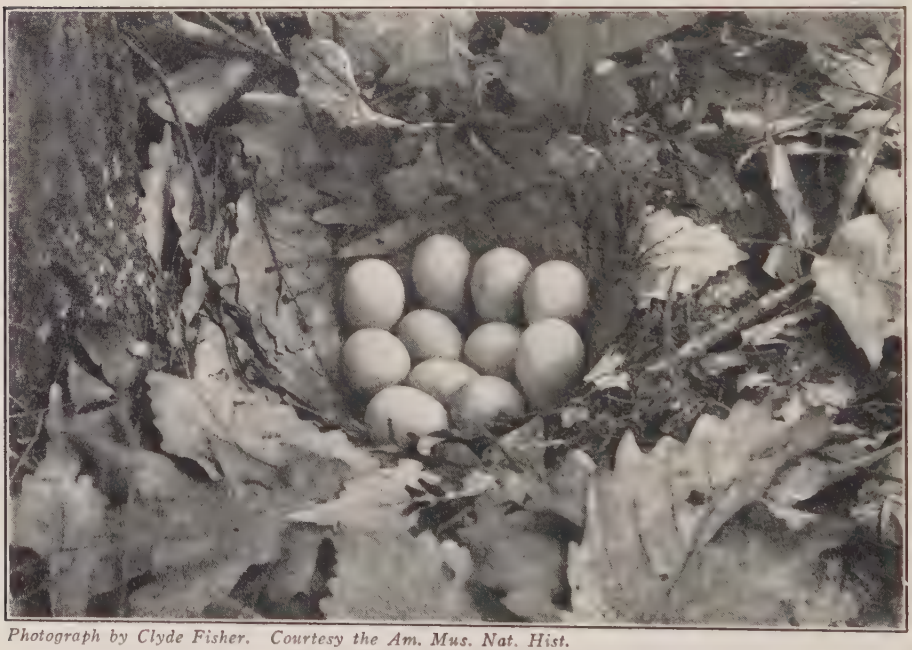
FOOD. What is the bird eating? Does it prefer seeds, berries, insects, fish or mammals? How does it secure them?

FLIGHT. Some birds, like the Goldfinch, may be readily identified by the way in which they fly. Do you know how the Goldfinch flies? You may say that birds fly in the following ways:

By *flapping,* as do the Crows;
Undulating, or flying in "sweeps," as do the Goldfinches;
Soaring, as do Hawks, or
Sailing, like the Sea Gulls. Their flight may be *slow, rapid,* or *erratic.*

MATING. Whenever possible make sure to observe the habits of courtship in birds. Some of them go through all sorts of amusing antics.

NESTING and YOUNG. Without disturbing the birds, you may learn of their choice of *nesting sites,* the *materials* used, *how the nests are made,* the *color* and *shape of the eggs,* and, sometimes, how long the eggs "take" before they hatch. When you are fortunate enough to find a nest always remember that you have discovered one of the bird's greatest secrets. The home is hidden to the best of her ability. It is your privilege to share the secret with her until the little birds have flown away. Never act in such a manner as to disturb or



Photograph by Clyde Fisher. Courtesy the Am. Mus. Nat. Hist.
THE RUFFED GROUSE'S SECRET

frighten either the mother or the young. You may observe how the young are fed, what they eat, how they are cared for, and the length of time they spend in the nest. Listen to their calls and be on hand for the great event of the "first flight." Yes, there are many things to seek in the realm of the birds.

There is a splendid lifelong pursuit in this field, alone. Whether you be an "agent" who reads meters, a scholar, a boy or girl scout or a full grown man or woman, the birds will ever await your coming. They have been here for countless centuries and yet there is much that we have to learn of their habits. Go out into the woods and fields with the birds, but never be satisfied until you have really learned to know them. The name is but a small part of the story.

Here are three very excellent books about birds. We are fortunate, indeed, to be able to secure them.

"The Bird, its Form and Function," by William Beebe, published by Scribners, New York.

Do not let the title frighten you!

"Bird Life," by Frank M. Chapman, published by D. Appleton and Company, New York.

My copy of this book is worn out from constant handling.

"Handbook of Birds of Eastern North America," by Frank M. Chapman, D. Appleton and Company, New York.

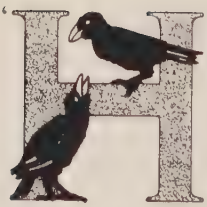
This book is indispensable. My friends, especially the Boy Scouts, have helped me to wear out two copies!

CHAPTER ELEVEN

CLEO AND MARK

"Few birds are more intelligent than the Crow. That he has a language, by which he can readily communicate with his fellows, and which can be translated in English, is now well known to ornithologists."

—ERNEST HAROLD BAYNES.



"HOW about some crows this summer?" asked one of the boys. "They are easy to tame and so much fun to watch! I think we ought to have at least two!"

I agreed with the boy thoroughly, for I had owned tame crows several times in years gone by. It was early in April, very near the time when the young birds should be secured from their stick-pile nest, high up in some tall tree. A light spring rain was falling easily upon the roof of the Trailside Workshop as we proceeded with the building of exhibits and animal cages for the little museum down the trail. Bear Mountain rose dimly against a gray sky, its summit partly shrouded with a veil of white fog. As we paused in our carpentry, there came from the nearby Hudson cliffs, the loud cawing of wild crows, flying up the valley. In less than a month, many people would visit our Trailside Museum. Yes! we must get some crows!

Now a crow is one of the wisest birds in all the world. There can scarcely be any question about it! These large, jet-black fellows, that live so close to the dwellings of human beings, and yet escape with their lives year after year, Summer and Winter, are indeed much more than clever. They are permanent ambassadors of the Kingdom of Birds, that are never discouraged by a lack of diplomacy on our part. Crows, with unerring wisdom, are able to adapt themselves to changing surroundings, to discover a means of livelihood where other birds fail, and generally, evade the gun and the hand of their powerful enemy. Our hats are off to the sturdy crows in true admiration for their ability to live in the face of hardship!

"Sam" was a young naturalist well acquainted with the habits of crows. When the time came, we sent him down to a spot on Long Island with which he was familiar. The very next day, he returned with two hungry black babies in a convenient, though outraged, cardboard box. The fledglings had objected strenuously to the train ride and had raised their youthful voices in steady protest all the way from Forty-second Street to Bear Mountain. Sam had an air of being genuinely relieved in body and spirit when he finally delivered the crows to us.

It was surprising and self satisfying to observe how quickly they learned to know and to trust us. Unlike many other birds, their brains seemed to grasp the new situation almost at once. At the end of three days, they had grown to like a diet of bread and milk and small bits of meat. They recognized us whenever we approached their cage and immediately clamored vociferously for food. Their growing stomachs were in constant need of fuel and thus the care of the infants proved to be no simple task. July saw the birds about doubled in size. No longer were they confined to a cage, for they became as tame as could be desired, and

PLEASE FEED US!

were welcome to stroll wherever they pleased. In two months these intelligent creatures had discarded the majority of their wild customs and were comfortable citizens in an accepted new state. Freedom was theirs again; but it was a dependent sort of freedom, for when the black twins tired of dining upon crickets and grasshoppers, they would wander over to the rear door of the cabin and beg until some one appeared with a more satisfying meal.

Even now, they preferred to be fed by hand. As long as we catered to this insistent whim, they refused to pick up morsels from the plate or from the ground. With noisy, appealing cries, they would open wide their red mouths, flutter their outstretched wings, and fairly shout to be fed. So great was the excitement, that their entire bodies would quiver with gluttonous enjoyment and a hungry, selfish eagerness as they gulped down the food. The ecstasy of the occasion passed all understanding. As particles of nourishment found their way into the cavernous gullets, the crows continued to shriek in a smothered, strangled way, until their throats were clear. Then the strident "cawing" was resumed with original vigor until one would imagine that, instead of merely being fed, the babies were being assaulted with intent to kill! Not for one moment, until their appetites were appeased, did they stop the disconcerting pleas for food and still more food!

Not many yards from the workshop stands the rugged, western toll-house of the Bear Mountain Bridge. On Sundays, and holidays, an almost steady stream of automobiles went back and forth like so many shuttles, over the long, gently arched highway that spans the Hudson River. On the afternoon of July Fourth, it was very warm, even in the shade. Bridge traffic was heavy and the number of visitors to the Trailside Museum great. As

we stood beside the red fox cage, giving a talk to a gathering of perspiring spectators, a boy came running down the trail and breathlessly announced,

"One of the crows is gone! We have looked all over for it! What shall we do?"

We were at once filled with alarm for we had all become firmly attached to the blue-eyed youngsters. Soon we reached the little group of anxious searchers who were examining the woods and bushes near the workshop. For half an hour we continued the hunt and then Tom suggested,

"Maybe it went over to the bridge toll-house."

We knew that the friendly babies liked the sound of voices, and that they exhibited at times a decided interest in moving objects.

We hurried to the toll-house, where the intermittent "clink" of the cash register sang a song of money in sliding drawers and of the eagerness of the public to be ever on the move. It was a busy, confusing scene as autos of every description rolled up, stopped with a squeaking of brakes, paused for a moment for the payment of toll and then darted off with a shriek of clutch and a vile burst of gas from heated exhausts. Certainly this was no place for an innocent, inquisitive little crow! After an impatient five minutes, the man at the cash register had a breathing spell and we asked,

"Have you seen a tame crow anywhere this afternoon?"

"Was that your bird?" he questioned. "Yes, there was a black bird that walked straight out into the road between two lines of cars. I was afraid he might bite and I was busy, anyway!"

Our heart fell clear to our toes as we asked, "What happened to it?"

"Well, I couldn't get it," said the cashier, "so I called Mrs. Thomas and she came right out and made me stop the cars while she picked up the bird. She's great with animals that way!"

We were overjoyed! Mrs. Thomas was a kind woman who had, many times, demonstrated to us her love for all creatures. She was the wife of the superintendent of the bridge. If she had rescued the runaway, all would be well!

Making our way into the toll-house, we discovered that, sure enough, the crow was safe and sound. There it sat upon the kitchen sink as Mrs. Thomas plied it with pieces of meat loaf! With heartfelt "Thank you's," we retrieved the bird and walked happily back to the workshop. The pets were reunited.

More than two months passed and still we had not been able to name our adopted children. They seemed content, and in no way offended by this lack of parental duty, and never chided because our originality failed to rise to the occasion!

One evening, as we sat upon the porch watching firefly lanterns flicker and glow among uncut grass tops, we were suddenly struck with an idea. Across the river Anthony's Nose caught the sun's last rays. It is a rounded mountain that, for many years, has been known to travelers up and down the Hudson. Though its name is strange and certainly lacks the dignity due so beautiful a mountain, it immediately gave us an answer to a problem. Anthony would be a fine name for a crow! And what name, other than Cleopatra could more fittingly be coupled with it? As we weighed the question and made up our minds, we finally reduced the titles to "Mark and Cleo." From henceforth our crows would no longer be nameless! One of them, fortunately had a white toe. It was the only means by which the birds could be distinguished, one from the other. The white-toed crow was henceforward called "Mark" and his sister "Cleo."

During warm summer days, when all of our nearby ponds were completely dried by the sun, Mark and Cleo loved to bathe in their private wash basin filled to the brim with clear water. Separately, they jumped in and then followed a joyful splashing, head ducking and wing flapping. So great was their desire to get thoroughly wet, that sometimes they lost their balance and toppled over. Water flew in all directions as the bathers rocked back and forth, hopped about and became more and more enthusiastic until they appeared to have forgotten all about their native element. It was a comical exhibition of active, athletic entertainment. After the shower, off they would go looking more like bundles of discouraged wet feathers, than the self respecting birds we knew them to be. Soon, they would be perched upon the stone embankment, preening and drying their bedraggled, dripping plumage.

Mark had a persistent thirst. He drank much more water than his sister. His peculiar habit of standing with one foot on the basin, and the other on the ground, moved us to call the drinking place the "crow bar." Down would go the long beak beneath the water and then straight up to heaven as drops of water trickled down the dry throat. Drink vied with food for a place of importance as far as Mark was concerned.

As time went on, our crows invented new means of amusing themselves, and others, too. They learned to hide any excess food that might be found. Both Mark and Cleo concealed extra bits of meat, lettuce and bread beneath boards, stones, cracks and crannies. Large clumps of grass would do if no other places were available. The meat was securely tucked away, and then a leaf, placed carefully over the hidden treasure, was poked down firmly by the strong beak. Match-sticks, buttons, nails and screws as well as other assorted hardware were carefully col-

Photograph by M. Peter Keane. Courtesy the Am. Mus. Nat. Hist.
ONE FOOT ON THE "CROW-BAR"

lected and hidden in the same way. Once "Cleo" picked up a match-stick before the flame was out. That match was never buried!

One night in August, a heavy wind and rain storm came rushing down out of the Highlands. The Hudson Gorge, at Bear Mountain, is very narrow and provides a magnificent setting for a storm. Henry Hudson knew this, and doubtless was happy to sail away from the spot. The wind and thunder roared and sped through the pass in triumphal bursts. A hundred echoes scattered far and wide above the gale-tossed water of the river. As we listened to the growing tumult, the rain poured thunderously upon our cabin roof—a billion tiny hammers on a trembling, wooden anvil. Trees leaned, branches groaned and

creaked, and all the surging leaves sang out to the music of the wind. It was a good night to be secure in comfortable quarters, and a chilling coldness sent us early to bed. We drifted off to sleep with the storm riding and galloping down the valley.

In the morning, a bright clear sun and a serene sky greeted us, as though there had been no weather upheaval for weeks. The more boisterous the storm the sooner it is ended! Traces were to be found, though, for broken branches lay about and the earth was hard packed from the rain.

"Mark" was sitting on the porch rail as usual, begging for food. The porch offered a fine shelter for the crows, and, although they were a bit of a nuisance there, we were only too glad to turn it over to their cheerful use. Mark cawed and scolded until, with a start, we realized that Cleo was not joining him in the morning duet. Forgetting about our own breakfast, we went out to where her brother sat. There he was all alone. Cleo was not in sight.

Uneasy premonitions crowded fast as we thought of last night's tempestuous storm. The roughness of it flashed before us as we informed the boys at the workshop, and together commenced our search. We looked in every possible hiding place; asked the people in the toll-house, even stopped a motorcycle officer who chanced to drive our way, but nowhere was "Cleo." She would usually answer us, especially if she were hungry when we called—"Hello!" We walked about the grounds, down to the cliffs, and along the trails shouting "Hello! Hello!" and "Where are you, Cleo?" But no answer came. The little black crow was gone. Our cries grew less and less hopeful and gradually ceased as the morning wore on. Sorrowfully we returned to our work. Never again would "Cleo" sit upon our shoulders and make soft, caressing little sounds in our ears as night approached.

A CROW TALK

What happened to her will ever remain a mystery.

Several days later, Sam noticed a large flock of crows, shouting noisily in the top of a high hemlock. Obviously, they were disturbed by something. We watched for some time and presently descried a large round shape on one of the branches. It was much larger than a crow, yet we had no glasses and could not identify it. We were about to turn away, when, with a slow, masterful flap of wings, the "shape" came to life. We were privileged to see a Great Horned Owl sail easily over the forest and out of sight. Perhaps this large bird of prey was the guilty one. In its nightly hunt for food, it may have found poor Cleo and straightway have brought about her untimely end. It was not a pleasant thought! We could not accuse the owl, however, for to be perfectly fair, we must admit that there was no shred of evidence against it. Too many birds and animals are falsely blamed for wrong doing. We should not join the ranks of the unjust, simply because our suspicions were aroused. Deep down inside of us, we knew that, after all, our loss was due to our own neglect. We should have taken better care of the crows on the night of the storm.

Mark now had all of our attention and affection and, if the truth were known, he looked as though he needed it! His ragged feathers were coming out, giving him the appearance of a lonely, half-plucked chicken. Outwardly, he did not seem to mourn or scarcely to notice the absence of his sister. He walked and strutted about as before, but who could say that he did not miss her companionship?

Sunday had gone and the crowds of people were journeying homeward. I sat upon a stool in the museum door reading. On my shoulder sat Mark, half asleep. He was mildly interested as I turned the leaves of the book. Several times, he

reached out with that exploring beak of his, and tested the pages with a light pinch as though to make certain that they would not go by unobserved. His soft jet head was now tucked between the shoulder "blades" and his eyes were shut. It soon became too dark to read and I walked up the path with Mark still balanced upon his perch. He was a happy, sleepy little bird.

A sharp breeze was blowing. It looked as though there might be a storm approaching. The tired crow shall be safely put away in his cage until the morning.

CHAPTER TWELVE

MARVELS IN SCALES

"If our romancer makes the snake fascinate the squirrel, I shall object, because I don't believe that snakes have this power."

—JOHN BURROUGHS.

"QUICK, there is a Copperhead Snake in the field! I was turning over stones, looking for beetles and there was its head, right between two rocks! What shall we do?" Arthur managed all of this in one breath.

Arthur is an excellent young naturalist of fifteen summers. I knew he had made no error about the kind of snake that had startled him.

"Hurry up!" he cried. "It may get away!"

The small field was directly in back of our workshop. Grasping a snake stick, I ran out and there, sure enough, was a Copperhead. Its head was barely showing above the long grass blades, while the rest of its beautiful body was entirely hidden. As I reached toward it with a long stick, several boys surrounded me much to my dislike. A Copperhead is a self-respecting creature that will fight when cornered and I wished I were alone. Very cautiously, the rod was placed beneath the snake's head in an effort to draw it out into the open where I could successfully cap-

ture it. I told the group of onlookers to "stand back," for suddenly, the reptile struck at the stick and then disappeared. Although I should have liked the Copperhead, alive and healthy to add to our collection, I was alarmed to have it loose and unseen in the grass where the young people were standing. So, rather than take any risks, I called out to Tom, who was standing nearby,

"If you see its head, strike it with your stick!"

Almost before I had finished speaking, out came the hunted snake, into plain view, trying to escape. In an instant it was all over. Tom acted quickly and decisively and there stretched the brown patterned serpent that had so unexpectedly come to the end of its journeys.

Of course, we knew that any poisonous snake had no place in regions where many people lived. We had no foolish sentimentality about this inevitable course of events, yet our minds began to see strange things. A long gray shadow, cast by Bear Mountain, just touched the motionless Copperhead lying so quietly on the field of combat. What are shadows anyway but paths into lands unseen? Slowly, we traveled back and back through the centuries to a time, long before the appearance of human beings on this earth, that we call "ours." In the land of bygone days, the land of the distant past, we presently saw the wonderful ancestors of the slain Copperhead, for we had come to the marvelous "Age of Reptiles"; a shadowy age when gigantic creatures lived and died, and fought and conquered, in a world unknown to Man except in the silent records of the rocks.

What a glorious day that must have been for the huge reptiles which roamed in early forest and plains! The dinosaurs were the kings of creation. The very ground must have trembled to their tread! What tremendous forces of nature could have caused them, after thousands upon thousands of years, to vanish from

sight? Only their skeletons remain to tell us of their existence, and to suggest, mutely, the enormous change that has taken place. Today, by killing a Copperhead snake, we have helped in the general extermination that has steadily progressed for countless years. Of the great tribe of different groups of reptiles, some of which flew through the air, only four are left. This world of scaled creatures is now represented only by the snakes, the lizards, the alligators, and the turtles. All of the others have gone forever.

I have long been interested in the habits of reptiles, in their coming and going, in their manners of life, and in the everyday happenings that befall them. I have sought them on mountain

A BABY SNAPPING TURTLE

sides, in fields and swamps, and have kept many in captivity that I might observe them closely, and, at the same time exhibit them to others.

Perhaps the snakes are the most fascinating of them all. Certainly they have been noticed and mentioned enough! Probably more false ideas are widespread about them than about any other living type of animal. There are no courts of justice for the snake! If one were ever called, the witnesses, the judges and the jurors would, no doubt, be so prejudiced that the case would go against the snake before the trial could come to light!

In the northeastern section of our country, we have about twenty-one different kinds of snakes. Due to the fact that they are distinctively marked, it becomes easy for us to tell one from the other. Only three of these serpents are poisonous. In seeking for them all, we will find that there is much for us to learn. There are many facts about the lives of reptiles, as yet undiscovered. We may be able to do a real bit of pioneering in this particular field. Before we discuss some of the snakes that frequent our locality, let us look at a brief list of "Facts and Fictions." In traveling about the eastern part of the country, especially at various fair grounds, I have collected many of these "snake tales." Some of them are as amusing as they are untruthful. First we shall give you some of these myths and then some of the facts.

SOME FICTIONS EXPLODED

1 It is *not true* that snakes are "slimy."
2 *No* snake has a "stinger."
3 Harmless snakes *do not* have fangs.
4 There is *"no such animal"* as a Hoop Snake.
5 It is *wrong* to say that snakes "spring off the ground" when they bite. They do not!

6 *No* snake milks cows.
7 It is *not true* that "lizards live in people's stomachs" (or salamanders, either!).
8 A rattlesnake's age *may not* always be told by the number of rattles upon its tail.
9 A rattlesnake *does not* always give a "warning" before it strikes; neither does it strike every time it rattles!
10 Snakes *do not* "charm" birds.
11 It is *not true* that a snake will live until "sundown" once its head has been severed from the body.
12 A snake that has been cut in half *will not* join together again.
13 It is *not true* that snakes always eat their shed skins.
14 Snakes *do not* "run after people."
15 The young of the rattlesnake and copperhead *are not* harmless for the first two months of their lives.
16 It is *not correct* to say that "nearly all snakes kill their prey by constricting."
17 *No snake* has a "poison dart" in the end of its tail.
18 It is *not true* that the mate of a slain snake will travel for great distances to seek revenge.
19 Snakes *are not* immune to fire.
20 It is *not at all true* that the bites of the copperhead and rattlesnake "always prove fatal."
21 There *are no* poisonous water snakes in the northern states.
22 Snakes *can not* live without water or moisture of any kind; neither can they live without air.
23 Snakes *do not* fear to cross a horse-hair rope.
24 Copperheads *do not* "smell like cucumbers!"
25 Poisonous snakes *may not* always be distinguished by a "flat triangular-shaped head."

Photograph by M. Peter Keane. Courtesy the Am. Mus. Nat. Hist.

THE HOG-NOSE IN NORMAL POSE

SOME FACTS

1 Many snakes *are* decidedly beneficial to man.
2 *There is* a snake that "plays 'possum." (It is the Hog-nosed snake.)
3 *Only* poisonous snakes have fangs (all snakes have teeth).
4 Some snakes *do* lay eggs and others give birth to active young.
5 It *is true* that some snakes climb trees.
6 Many snakes *do* swallow objects that have a larger circumference than their own bodies.
7 Snakes *do* have forked tongues that flicker in and out.

Photograph by M. Peter Keane. Courtesy the Am. Mus. Nat. Hist.
THE HOG-NOSE PLAYS 'POSSUM

8 Harmless king snakes *are* able to kill and devour such poisonous snakes as the rattlesnake and copperhead without being overcome by poisonous bites. King snakes are cannibals! They are immune to snake poison.

9 We *should not* fear snakes. We should have a healthy respect for the poisonous ones, nevertheless.

10 It *is true* that snakes are delicate animals that are only too easily killed.

11 Some snakes *may* be "tamed."

12 A snake *has* a heart.

13 Some snakes *do* have dens to which they return for hibernation.

14 It *is true* that some snakes feed only upon cold-blooded animals and others prefer warm-blooded food.

15 Snakes *can* fast for many months. (I once kept a copperhead that refused food for eleven months and sixteen days; then it died!)

16 Many snakes *are* excellent swimmers.

17 Some full grown snakes *will* swallow young ones thereby making a good meal!

We have yet to be convinced that a maternal snake will swallow her young for their protection. This is a touching thought, but is it more than that?

18 Snakes' teeth *are* recurved.

19 It *is true* that rattlesnakes have other growing fangs with which to replace those that may be lost.

20 Some snakes *may* swallow a hen's egg without first breaking it.

21 There *are* snakes that live or spend some time in gopher holes. Usually if there be a gopher present, it is inside of the snake!

22 Snakes *are* able to digest hair, feathers and bones.

23 Snakes, such as the blacksnake and milk snake, vibrate their tails very rapidly when alarmed, thus often producing a distinct "whirring" sound.

24 Reptiles, such as the garter snake, *do* emit a powerful defensive and offensive odor when handled.

25 Two headed snakes *have* been found. These are "freaks."

These fifty "Facts and Fictions" are but a few of the many that might be told. The truth is that snakes have been so grossly misrepresented in print and in the spoken word for so many years that people have reached the stage where they seem to *prefer* the fantastic rather than the true. When this type of person insists in believing the "fiction," it is practically useless to try to explain the "fact." As young or as older naturalists, every one of us can do our bit in correcting some of these reptilian errors, these snake myths, by seeking the facts for ourselves and then by imparting our information to others. It is no simple task, but it is well worth the doing.

In our study of snakes, we shall probably discover that it is important to collect living specimens. We very soon learn that snakes are fascinating creatures to handle as well as to watch. Before we go into the field, however, we should know the character of some of our principal local snakes. First of all, we should be thoroughly instructed in the manner of distinguishing the poisonous from the harmless reptile. It will not, by any means, do for us to collect snakes unless we are first able to *know* beyond any doubt just which of the snakes are safe to handle. Furthermore, we should leave the collection of harmful snakes to the experts. This is a necessary caution. Our purposes may be well served with the harmless varieties. We need not fear

the Rattlesnake or the Copperhead, but we must respect them. A word to the wise is a *good* word.

Let us glance at a list of the serpents that may be found in our northeastern states, well above the Mason and Dixon line. Here are the three poisonous ones.

1 THE TIMBER RATTLESNAKE.
With the exception of the Adirondack Mountains, this snake is found from Pennsylvania to Maine in the eastern states. It is abundant in very few places. Its range extends to northern Florida and to the western plains.

2 THE MASSASAUGA RATTLESNAKE.
This snake is to be found in the eastern range, in western New York State, in Onondaga and Madison Counties.

A TIMBER RATTLER

3 THE COPPERHEAD SNAKE.
From Massachusetts to northern Florida and westward to Texas the Copperhead may be found.

Note: In identifying our three northeastern poisonous snakes, it should be remembered that although the Rattlesnakes may always be told by their rattles, the Copperhead is more difficult to identify. The appearance of this snake, when the skin is newly shed, presents a series of separated patterns of a darker brown, in the shape of an hour-glass, upon a background of light, reddish brown. The mouth sections are often of a beautiful amber hue. Sometimes, particularly when the snake is about to shed, it has been mistaken for a milk or a water snake. Careful scrutiny of the patterns, however, will at once reveal the true character of the serpent.

Both the Copperhead and the Rattlesnake have *elliptical eye pupils*. Also, due to the fact that they are members of the *Pit Viper* tribe, they have small hollows, or "pits" sunken in the head between the eye and the nostril opening.

The following list enumerates the *harmless, non-venomous* snakes that inhabit our North Atlantic and New England States. This is given without any particular arrangement and includes some very interesting creatures which are much more than worth our careful study.

4 Pine Snake
5 Hog-nosed Snake or Puff "Adder"
6 Pilot Blacksnake
7 Blacksnake
8 Milk Snake
9 King Snake
10 Corn Snake
11 Water Snake
12 Queen Snake
13 Ribbon Snake
14 Garter Snake

15 Green Snake
16 Keeled Green Snake
17 De Kay's Snake
18 Storer's Snake
19 Worm Snake
20 Smooth Brown Snake
21 Ring-necked Snake

This check list of twenty-one reptiles will serve to show the names of some of our local serpents. If you live in the south or west you will, of course, discover additional species. Regardless of where you live, however, there are many questions to be answered in the field of "snake habits."

1 Does the snake lay eggs, or are its young "born alive"? (When and where and how many?)
2 What does the snake eat?
3 How often does it shed its skin? (When and where?)
4 Does it "climb" trees or bushes?
5 Is it swift or sluggish in its movements?
6 When does it go into hibernation? (If at all?)
7 Where does it hibernate and when does it appear in the Spring?
8 Where does the snake live, among rock, timber or sand, or in fields, swamps, beneath or above ground, etc.?
9 How long is the snake? (Exactly?)
10 How does the snake drink? How often?
11 Discover which snakes have "smooth" and which ones have "keeled" scales.
12 Which ones feed upon "warm-blooded" and which upon "cold-blooded" prey?

Some suggestions for the feeding of snakes might not be amiss here. It should never be forgotten that snakes are entitled to proper care when they are in your possession. If you can not give them sufficient comfort, then they should not be caught.

Nearly all of our local serpents are distinctly beneficial to man, therefore, they should be given our protection.

The green snake will thrive on grasshoppers, crickets and caterpillars. Ribbon and garter snakes will eat smaller snakes, frogs, toads and insects. The hog-nosed snake accepts toads, frogs, newts and insects. Many of these smaller snakes will also welcome meal worms. The blacksnake likes rats and mice. All snakes need water. They like to bathe as well as drink. Do you know that you can see a snake "swallow"?

Good reference books are,

"The Reptile Book" (Reptiles of North America) by Raymond L. Ditmars. Although this excellent book is "temporarily out of print," it may be found in many libraries. It describes the turtles and the lizards as well as the snakes. It is published by Doubleday, Doran and Company, Garden City, Long Island.

Bulletin of the New York Zoological Society, Volume 32, Number 3, May-June, 1929. This pamphlet is devoted to snakes. Dr. Ditmars, who is the author, has probaly done more to further reptile study in this country than any other American.

"Reptiles and Amphibians, Their Habits and Adaptations," by Thomas Barbour, Houghton Mifflin and Company, Boston and New York.

CHAPTER THIRTEEN

LIVES OF THE MOIST-SKINNED

"Thus was the ending still unfinished, the finale buried in the future—and in this we find the fascination of Nature and Science."
—WILLIAM BEEBE.

PERHAPS you like detective stories, filled with excitement and with mysterious happenings. You have undoubtedly enjoyed many tales that aroused your fancy and your sheer admiration, but have you ever read of the "Moist-skinned"? Have you heard of the small animals whose lives are often shrouded in the secrets of both water and land? These are creatures that possess a powerful urge to revel in shadow and shade. They seek curious places in the strange world they love where soft, green moss, trickling silvery brooks, and silent pools mean safety and life itself. In this world the lack of moisture spells doom and death. The lives of these unique animals present the quality of pure adventure that has to do, very intimately, with the greatest of all mysteries—Life!

On a bright summer day, Sam and I decided to go in search of some of these "moist-skinned" creatures. The only equipment needed was a tin can, with tiny holes punched in the cover and an empty pickle bottle with a cap. Our hunting expedition, thus

lightly equipped for very small game, was to lead us to the tree-bordered valley of Popolopen Creek. This little stream, rising in the Highlands, flows down through its narrow, spray-lined channel into the restless Hudson. It is doubtful whether any stream more picturesque or delightful may be found up or down the large river that knows so many tributaries. Green hemlocks line its steep banks, giving a deep and a cool shade to the moist, black soil that knew the tread of soldiers during the days of the American Revolution.

Slipping and jumping down among great boulders and walking softly on beds of moss we reached the shore of the creek where a very crooked path led along to the west. The abrupt sides of the bordering hill was a careless, mosaic design wherein smaller stones, bits of decayed wood and fern clumps all had their individual places and were edged with the darker earth that concealed rock masses, beneath. These stones, as well as the pieces of wood were very important in the work at hand, for they sheltered many of the creatures which we sought.

Sam was the first to make a catch. As he walked along, peering cautiously beneath the stones and the fallen wood, he suddenly raised a loosely embedded, flat rock. There was a quick gleam of a round black tail as the disturbed creature darted away. Sam's hand shot out like a flash, and in a moment the small animal was resting upon some moss at the bottom of the pickle jar.

"I've got one!" cried Sam. "It's a big one, too! Come and look at it! It's a 'Slimy'!"

Sure enough, it was a "slimy"; a graceful salamander whose unfortunate name is the result of a protective covering of mucus which the creature exudes through the skin when handled. It was about five inches long and its slender, black body was dusted with patches of little silvery spots. This member of the tribe of

Photograph by Hugh Rice. Courtesy the Am. Mus. Nat. Hist.
SLIMY SALAMANDER

the "moist-skinned" was very active in its rushes to escape. It was a true dweller of the damp forest floor.

All the afternoon we wandered up stream with considerable success in our salamander collecting. As the sun went slowly down beyond Torne Mountain, we turned our steps homeward with about twenty of the creatures in our possession. Our fingers were stained with the earth and our backs were sore from much bending, but we were happy, for our collection was enriched.

Now the mere hunting for salamanders does not teach us a great deal about them. To be sure, we learn where they live. Like a veritable Sherlock Holmes, we leave but few stones unturned in our quest. Nevertheless, if we would read the most

interesting part of this story, we must carry our investigations further. Of course, we realize that there are many different kinds of salamanders that live in almost as many different situations. They are called "Amphibians," for like the amphibian aeroplane, they are able to travel, and at different stages in their development, live, both on land and in the water. We know that they are placed just below the reptiles and just above the fish on the scale of animal life. They have been called a "connecting link" between the two great groups. In making further observations of these amphibians, we soon come to the really amazing part of the story. The catching of the animals is tame in comparison.

Our real introduction to the wonderful lives of these creatures of the moist skins came about in this fashion.

One cool morning in early May, when the filmy fog mantle had not yet arisen from the nearby Hudson, we went to a small pond to dip for polliwogs. Not far from the pond's edge there was a jelly-like mass, floating just beneath the surface, attached to a twig. It looked like a ball of tapioca pudding that had strayed from the kitchen and, in some inexplicable manner, had met this strange fate. Placing the dip net very gently beneath the mass, we raised it from the water and deposited it in a pail at our feet. The slightly rounded form was about the size of a child's fist. On close examination, it proved to be composed of many tiny spheres all fastened together by a shapeless, yet stubborn, filament of jelly. Within each of the spheres, or globes, was to be seen an elongated black spot. After several minutes of careful watching, very suddenly we saw one of the black dots fairly leap into action. It twisted and wriggled for an instant and then was motionless, again. Presently the occupant of another globe did the same thing. Here was life! These minute but perfect balls

were all inhabited. The whole group was a globular tenement house, a definite incubator for several hundred potential amphibians. It was the egg mass of that fascinating animal, the Water-newt.

Returning to the museum, we placed the eggs in an aquarium filled with pond water. The mass sank slowly to the bottom and there it stayed for a week, waiting for the great event that was soon to take place.

One morning, several tiny, swimming animals were seen in the water tank. They darted here and there like so many whirligigs. The hatching time had come! Some of the spheres were empty for the tenants were no longer to be confined. The time had arrived for them to take their places in the world, to escape from the bond that prefaced their birth. Frayed and torn edges upon the underside of the egg mass told an eloquent story of departure and showed the underwater opening through which the young, or larvæ, had emerged into a field of more active existence.

Lying upon the bottom of the aquarium, the little colony of swimmers looked like so many miniature submarines, awaiting the word to go. Every day saw the birth of many more, until, at length the jelly-like incubator was but a shattered and deserted hulk; an inanimate yet faithful protector, the services of which were no longer required. Its many bubbles were all burst, literally and finally.

At the end of three weeks, the infants had grown to be nearly an inch in length and were very much in evidence as they scurried spasmodically about upon unannounced errands. When disturbed, they showed instant energy and dashed with reckless, headlong speed, turning sharp corners and occasionally bumping against the unyielding side of the glass tank. When at rest, the

would-be salamanders lay at extended ease upon the aquarium bottom, seemingly content with their surroundings.

Perhaps the most interesting thing about the appearance of the swimmers was their possession of three pairs of feathery "antlers" upon the sides of their rounded heads. These antlers were really external gills through which the creatures breathed.

Viewed through that great discoverer of secrets, the microscope, these little fringed gills looked like antlers, indeed. They were the most delicate of antlers imaginable. The throbbing life stream of surging, colorless blood, flowed in waves through the transparent channels of the gills as it did throughout the body and almost all of the thin, web-like tail. This pulsing flow

Photograph by Irving Dutcher. Courtesy the Am. Mus. Nat. Hist.

SALAMANDER TADPOLE. LOOK FOR THE "FEATHERY ANTLERS"

journeyed through its controlling tubes in response to the beating of the tiny pink heart that we could clearly see through high powered lenses.

We felt responsible for these baby salamanders as indeed we should! After all, we took them from their native pool in the first place. Thus, when a visitor asked us what the water babies ate, and how they secured their food, we were a bit disturbed, for we did not know and consequently could not answer! Of course we believed that the young ones swallowed small, living bits of life that existed unseen in the water. They must have fed upon something! After the inquiring visitor had gone, we decided to watch carefully and try to discover as much as we could about the feeding habits of our tank of salamanders.

Taking one out in a small net, we deposited it in a jar of fresh pond water. The infant soon came to rest near one side of the vessel. Through a hand lens, its beautiful golden eyes with jet black centers could be seen. These eyes, expressionless as they were, seemed to have an air of expectancy about them, but this may have been because we were too expectant ourselves! How often we make the mistake of translating things in the false light of our own emotions of the moment.

Swimming about in the water were many almost microscopic animals, barely visible to the naked eye. Every moment or so, the salamander, now at home in its new jar, would make a swift "pass" for one of these creatures. Watching very closely through the lens, we could see it engulf an animated speck nearly every time it moved toward one. The speck would be mouthed for awhile and then ejected. In the half hour or so that we watched, not one single mouthful did our hungry captive retain within its transparent stomach. It was apparently satisfied with a "taste."

The salamander tadpole appeared to see its living food as it

moved within the range of vision, for sometimes it would turn its head and snap for an object in much the same way that a fish would do.

We were anxious to find what this food consisted of. With a medicine dropper, one of the swimming food particles was collected. It had thus far evaded the waiting salamander only to fall a prey to our curiosity. Under the microscope, this creature swam for the last time, in a drop of water. What animal was this that could navigate in a drop? When it finally became still, it was at once identified as none other than a Cyclops, a name, no doubt, deserved by virtue of the lone eye in the center of its head. The microscope later disclosed similar types of food that the newly "hatched" one fed upon.

The last time we had heard of a Cyclops was when traveling in imagination with the tremendous Ulysses and with that gifted prevaricator, Sindbad the Sailor. We had pictured the Cyclops as an evil genii looming high in the ranks of story book villains. What a remarkable thing it was, therefore, to learn that the patient scientists had named the drop swimmer by the same name! Here was the true, pitiful Cyclops, serving as food for a creature less than one inch in length, only to be drained of life and power and then ejected with the very slightest effort! This was a tale that easily outdistanced poor Sindbad at the height of his narrative ability.

All during the summer, our little salamanders lived in their tank. At the end of the season, they were released in the pond from which they had been taken. We were not to have the pleasure of watching them further. It was a pity that we were forced to forego this opportunity, for we thus failed to see the second transformation. The released babies were equipped with four legs, and, as they swam down toward the pond bottom, their limbs were all brought into play.

Photograph by Hugh Rice. Courtesy the Am. Mus. Nat. Hist.

THE WATER NEWT ASHORE

If we had been enabled to study our young Newts for a longer period of time, we should have discovered that after awhile the external gills would have disappeared, the length of the Newts would have increased and generally they would have so changed in appearance, that we would have been tempted to forget the early life stages that led to the full grown creature.

In the Hudson Highlands, many of the grown Newts forsake the ponds that sheltered them and seek an existence upon the land. They are then known as "Red Efts." Country people sometimes call them "Rain Lizards" or "Mountain Lizards" despite the fact that, unlike the lizard, these animals do not possess scales. They are not lizards at all! Newts, deciding to leave the

water, change in color from an olive green to bright red. This coloring is partly responsible for the local name "Fire Lizard."

What a remarkable creature is this Water-newt! During its lifetime it changes its method of breathing and may even change its living quarters from water to dry land. As we have seen, its color may also be varied from greenish to red. It is truly a gifted animal that, through the centuries, has learned to live placidly in totally different environments at different times. Those of us who are sufficiently interested in these creatures may secure and keep them during all of the unusual changes that feature their lives. We may care for the water form in an aquarium, feeding them with small earthworms or pieces of raw beef. To witness two Water-newts, each grasping an opposite end of a worm and each pulling and swallowing at the same time, is to see an aquatic tug of war that will bring a laugh to the most serious of onlookers. The unfortunate worm probably does not see the joke! The Red Eft, or land form, is soon at home in a vivarium where it will thrive upon a diet of ants' larvæ, ants, earthworms and meal worms.

Is it at all strange that the salamanders with their mysterious ways of life and reproduction should have excited the imaginations of our early Colonists? From ancient times, this little animal has been associated with fire. Many people believed that the salamander could endure the flames and the heat only to emerge unscathed. There is one peculiar legend that has to do with the Ramapo Mountains, not many miles from Bear Mountain. Before we list the names of some of our local salamanders, let us read this tale of how the amphibians have been known in times gone by.

This is the mystical story of the "Ramapo Salamander" told by the Rosicrucians, those queer philosophers who claimed to

have the power of prolonging life, of transmuting metals and of discovering hidden things at great distances. According to these "Brothers of the Rose Cross," there was once a group of German colonists who settled in the Ramapo Valley in houses constructed of stone. The Indians, who lived nearby, would have delighted in wresting the land from the invaders. However, when the savages observed that the Germans made iron tools "out of the rock" by means of fire, they were overawed and dared not attack these white men whom they took for manitous, or gods.

Not far away, on Torne Mountain, there had lived Amasis, the youngest of the magi who had been led by the star of Bethlehem. He had come by way of Asia and Alaska and had married a native woman who had presented him with a child. When the Indians insisted that he take their faith, he refused. He built a temple upon the mountain top, thus showing that he would not worship the sun. The Indians were so angered that they attacked and would have killed him had not a tremendous earthquake rent the ground at that instant. Into this great earth gap fell everyone but Amasis and his daughter. Thus was a new channel formed for the Hudson! To the survivor came the vision of magical wealth in the rocks.

Now the leader of the colony of Germans was a man of noble birth whose name was Hugo. He was evidently a self determined man who was a bit headstrong. In the old country, the metal workers had been wont to put out their forge fires once during each seven years for fear of a salamander! This animal had an evil power to do harm. It developed in the fire and thus every seven years the fires were permitted to die that the salamander could not reach its full growth and go abroad on its mission of wickedness. Despite the pleas of his men, Hugo refused to have the forge fires extinguished. They were kept burn-

ing steadily. It came to pass that the fire had been harboring a salamander! The workmen saw it but were powerless to prevent its subsequent action. Hugo was rendered unconscious by the mere sight of it, and his poor wife, sprinkling holy water into the furnace, died either from fright or from the effects of illness. Seven years later Hugo's little boy strangely disappeared and only his daughter remained to comfort him.

The unfortunate Hugo led his daughter to the Torne Mountain top and there revealed to her the treasures in jewels that Amasis had seen. In the bottom of the cave was a salamander whose brilliant, flame colored body cast an unearthly light upon the rocks and tinted the very clouds above. Some unknown words, perhaps containing the secret of the jewels, burned in a triangle upon the salamander's back. Hugo was unable to read the inscription, however, for when his daughter accompanied him, her prayers prevented him from seeing clearly; and when he went alone, he met with no better success.

A short time after the visit to the mountain, a stranger appeared in the village and Hugo's daughter almost at once fell in love with him. Very shortly, she learned that her beloved one was in the power of the dreaded earth spirit, the terrible salamander. Once again, Hugo, the remorseless, entered the scene. So great was his anger at seeing the couple together, that he grasped the stranger, who did not resist, and cast him into one of the burning fire pits. Again, was the salamander of the Ramapos evoking his evil, for Mary, Hugo's unhappy daughter, saw a "shape in robes of silvery light" rise up and up until it vanished in the night. Her lover had been redeemed by fire and thus released from the grasp of the earth spirit. So we come to the end of a story of "unnatural history" in a book of natural history!

Now to return to our facts! Here is a list of some of the moist-skinned animals that may be discovered in our north-eastern region, especially within the radius of fifty miles from New York City.

Bull Frog	Slimy Salamander
Green Frog	Dusky Salamander
Leopard-frog	Red-backed Salamander
Wood-frog	Water Newt and Red Eft
Spring Peeper	Marble Salamander
Gray Tree Toad	Tiger Salamander
Pickerel-frog	Four-toed Salamander
Anderson's Tree Frog	Jefferson's Salamander
Cricket Frog	Red-backed, Gray Salamander
American Toad	Spotted Salamander
Fowler's Toad	Purple Salamander
Spade-foot Toad	Muddy-spring Salamander
Red Salamander	Two-lined Salamander

Some of these Amphibians have rarely been discovered. Any notes as to breeding habits should be carefully made and records of occurrence carefully kept.

It is true that we may witness all of the links in the tremendous chain of events that lead to the development of the grown animal, whether it be mammal, bird, reptile, amphibian or insect. Our scientists may study these links minutely, ever seeking to part the dark, mysterious curtain that may conceal the ultimate solution, the final answer to the question, "Why do these things occur?" But never, never shall we be able to reach beyond that curtain. We may see what nature reveals, but that is all, for the revelation does not deal with the true source, with the remote past. It gives but facts upon which we may build our own deductions. The more we seek, the more we will learn, but ever

will that supreme riddle of the ages confront us. It is the riddle of creation.

"The Frog Book," by Mary C. Dickerson, should be read by all students of Amphibians. It is published by Doubleday, Doran and Company, Garden City, Long Island, New York.

"Backyard Explorations," by Paul Griswald Howes, has a good chapter on Salamanders. It is published by Doubleday, Doran and Company.

CHAPTER FOURTEEN

ANIMAL NAMES IN NATURE

"An Animal is a living creature belonging to the animal kingdom; but the word is commonly, though incorrectly, used to designate mammals alone."

—WILLIAM T. HORNADAY.

IN the world of wild nature, many creatures have been given names by scientific naturalists who have studied them for years. You might be surprised to learn how long a time has been spent, in some instances, to select these titles. Anyone of us who has been given a name is entitled to be called by that name. To be sure, there are "nicknames," but the real name is most important. With animals, the case is the same. We, who are to become acquainted with these animals, should learn to know their correct names and to remember them. As with everything else, there is a right and a wrong way of doing things. A young naturalist would do well to follow the right trail, the right signposts, on the way to nature knowledge. The names are the signposts and the trail is another thing altogether. It is our desire to walk this trail, taking care, meanwhile, not to forget the signposts that point the way.

Animals have been divided into great groups, or "classes," into families and species. Every creature that is not a plant is an animal. Insects, reptiles, and birds, for instance, are all animals as well as are the four-footed animals such as the dogs or squirrels. Thus, when we say "animal," we do not mean, or should not mean, the four-footed creatures alone. We should include the snakes and the ants as well as the opossum and the chipmunk. All of this has been planned for convenience sake to help us to think clearly about our nature work or play, as you will.

Nature study is like a jig-saw puzzle. It is made of various pieces of information that fit together, perfectly, once we have found the key. If we know something of the *system* of this wonderful game, it will aid us to enjoy it all the more.

It seems that always, we regard ourselves as the most important objects upon the face of the earth. We think of "man" as the very head of all of the creatures in the universe. This may be a fortunate or an unfortunate state of affairs. That is for you to decide! It is true, however, that man, in the field of animal life *is* at the head of the scale. As man is a mammal, we may do well to look at this great "class" of animals, first.

When we are thinking of "Mammals," we speak of animals that possess warm blood, and hair; and that "suckle," or "nurse," their young. Birds have feathers and reptiles have scales, but only the mammals have hair upon their bodies. This is one thing that distinguishes or "makes them different" from all other classes of animals. Knowing this, we may say that the first piece of our animal jig-saw puzzle has been found. Now, if we can locate some of the other pieces, that fit about this first one, we will go farther along and the game will progress quite rapidly.

Photograph by Clyde Fisher. Courtesy the Am. Mus. Nat. Hist.

THE OPOSSUM "SLEEPS"

MAMMALS

We have said that the name "Mammal" was the first one that we sought to find. How about the other names that group about it? I will give some of them to you, for we have discovered the "class" and now we shall know about the members of this "class." With the word "Mammal" at the top of the list, we can see, as scientists have seen, that the various families that belong in this list should be arranged in order beneath the main heading. Here is a list of some of the most important in the realm of the "Mammals." I am going to give you the Latin names, for these "orders" too. We shall learn why, later on. The name of the *order* will come first and then will come the name of some of our own mammals that belong in the order.

I POUCHED MAMMALS (Marsupialia)—
The Opossum.
(The young of these mammals are carried about in their mothers' pouch during their early life.)

II INSECT EATERS (Insectivora)—
The Mole and the Shrew.
(Small animals that live underground in hidden tunnels and live upon insects.)

III THE BATS (Chiroptera)—
(These are the only mammals that really fly. Their long "fingers" are covered, like the wings of model aeroplanes, with a thin membrane of skin.)

IV FLESH-EATERS, OR MAMMALS OF PREY (Carnivora)—
The Cats, Weasels, Foxes, Dogs, Bears and others.
(This group of mammals live upon flesh for the greater part and are fitted for their lives with claws and sharp teeth.)

V GNAWING MAMMALS (Rodentia)—
The Rats, Mice, Squirrels, Muskrat, Beaver and Porcupine.
(The Rodent group has more species, or more different kinds, than the total of all other families of mammals. The structure of their front teeth is unlike that of any other type. In addition to the grinding teeth, or "molars," there are two teeth in the front of the upper jaw and two in the front of the lower. Catch a mouse and look at its teeth!)

VI THE ARMADILLOS OF THE FAR SOUTH (Edentata)—
(Mammals without any front teeth.)

VII HOOFED MAMMALS (Ungulata)—
The Deer, Sheep, Cows and Horses.
(You can see that the possession of "hoofs" upon their feet mark these animals as being different from any others.)

Photograph by Clyde Fisher. Courtesy the Am. Mus. Nat. Hist.

A GRAY SQUIRREL FEAST

VIII WHALES AND PORPOISES (Cetacea)—

(Yes, these creatures of the oceans are mammals too. In olden times, they were called "fish," but we know that they breathe, not with gills, as the fish do, but by means of lungs. They bring forth their young alive and feed them, at first, upon the mother's milk.)

BIRDS

Birds are the next members of the Animal Kingdom that we will investigate. We know that the feathers of these creatures of the sea, the land and the air, set them apart from all other forms of animal life. They, too, are members of a class. The *Class Aves*. Once more we find that there are *orders* and *families* and *species* that are grouped beneath this *class* of animals. Instead of having all of the birds arranged, say in an alphabetical list, we find that they are placed in orderly fashion, according to their various characteristics, in quite a different type of arrangement. Here it is. First, we have the *Water Birds*.

I DIVING BIRDS (Order Pygopodes)—

Grebes, Loons.

(Webbed feet placed back near the tail; tail very, very short.)

II LONG-WINGED SWIMMING BIRDS (Order Longipennes)—

Gulls, Terns.

(Long wings with sharply pointed ends.)

V OTHER SWIMMING BIRDS (Order Anseres)—

Ducks, Geese and Swans.

(Tooth-like edges on the bill, troughs or sunken ridges on the sides.)

VII LONG-LEGGED WADING BIRDS (Order Herodiones)—

Herons and Bitterns.

(Toes slightly, or not at all, webbed.)

A CITY PARK IS A FINE PLACE TO SEE DUCKS

VIII OTHER WADING BIRDS (Order Paludicolæ)—
Rails, Coots and Gallinules.
(Bare shield upon forehead, stout, strong bill.)

IX SHORE BIRDS (Order Limicolæ)—
Snipe and Sandpipers (Woodcock, Spotted Sandpiper, Wilson's Snipe, Plovers, etc.)
(Long, slender legs; soft, narrow bill.)

Now we come to the group of *Land Birds*.

X GROUSE AND ALLIES (Order Gallinæ) (Scratching Birds)—
Bob-white, Ruffed Grouse, Turkeys.
(Bill stout, horny and firm.)

XI PIGEONS AND DOVES (Order Columbæ)—
Mourning Dove.
(Slender, grooved bill, nostrils in fleshy tissue.)

XII BIRDS OF PREY (Order Raptores)—
Vultures and Hawks, Falcons, Eagles and Owls.
(Toes with sharp talons, sharply hooked beak.)

XIV CUCKOOS AND KINGFISHERS (Order Coccyges)—
Yellow-billed Cuckoo, Black-billed Cuckoo, Belted Kingfisher.
(Tail feathers not pointed, four toes, middle and outer ones partly joined.)

XV WOODPECKER (Order Pici)—
Downy Woodpecker, Hairy Woodpecker, Red-headed Woodpecker, Flicker, etc.
(Two toes in front, one or two in rear; tail feathers pointed.)

XVI THE WHIP-POOR-WILLS, HUMMINGBIRD AND SWIFT (Order Macrochires)—
Nighthawk, Whip-poor-will, Chimney Swift and Hummingbird.

(See Frank M. Chapman's, "Birds of Eastern North America," pages 118 to 132 for "A Key to Families.")

XVII PERCHING BIRDS (Order Passeres)—

Flycatchers, Larks, Crows and Jays, Orioles, Blackbirds, Grackles, Bobolink and Cowbird. Sparrows and Finches (Redpoll, Snowbird, Crossbill, Grosbeak, Goldfinch, Towhee, Indigo Bunting, Cardinal), Tanagers, Swallows, Waxwings, Shrikes, Vireos, Warblers, Thrashers, and Wrens (Catbird, Mockingbird, Brown Thrasher, House Wren, Winter Wren, etc.), Creepers, Titmice and Nuthatches. Kinglets and Gnatcatchers. Thrushes, Robins and Bluebirds. (Hind toe as long as front middle one.)

We have divided our native birds into thirteen different *orders,* omitting five of the entire list. You may easily see that the order of Perching Birds has the greatest number of species or kinds. We could go still farther, of course, and divide each of these *orders* into families. It is, indeed, a great help to us in our pastime of becoming acquainted with the birds and other animals, too, to have their names so nicely arranged in these groups. If we are interested in knowing just why they are placed or grouped in this way, we may find out by reading books about birds that deal with this particular subject. All we desire, now, however, is an *introduction* to the names.

REPTILES

The Reptiles are next on our list. Let us consider them in the same way that we have the birds and the mammals. Again, we will not go into any detail about these creatures except to mention the four orders. Scales, of course, are an important clue, or characteristic, that may be found on all reptiles. Here are the groups of this particular *Class.*

I THE TURTLES AND TORTOISES (Order Chelonia)—
Box Tortoise, Painted Turtle, and many others.
II THE CROCODILES (Order Crocodilia)—
III THE LIZARDS (Order Lacertilia)—
The Fence Lizard, the Blue-tailed Skink, etc.
IV THE SNAKES (Order Ophidia)—
The Garter Snake, the Milk Snake, etc.

AMPHIBIANS

As we go down the scale, through the realms of the Animal Kingdom, we next discover the Amphibians, the small animals with *moist skins*. These interesting creatures, some of which are no doubt familiar to us all, are arranged in orders beneath their own class heading of *Amphibia* in the following way.

I THE SALAMANDERS (Order Urodela)—
The Tiger, the Spotted, the Marbled and other Salamanders.
II TOADS AND FROGS (Order Salientia)—
The Tree, Bull, Green and other frogs; and the American, Fowler's and other toads.

We have mentioned four *classes* of animals which have been discussed in the chapters of this book. The fish, the insects and other *classes* will not be included here; for, despite the interest that we have in their lives, we must wait until another time, to describe them. Now we come to the answer of the question, "Why Latin names?"

We know that various animals are distributed throughout the world. We also know that the language of mankind differs as we go from one country to another. If we would speak and write of the many types of animals, so that the people of all nations would understand, we must have a "code-word" for each of the creatures described. In this way, the use of Latin comes to

our rescue. These Latin code-words are universal symbols of scientific language that are comprehended by scientists the globe around. Regardless of what language our foreign naturalistic friends may speak, we may be certain that they will all know and use Latin names as far as animals are concerned. Indeed, scientists of our own land, also, employ these terms, for they represent the generally accepted proper names for *orders, families, species,* and *sub-species* of our animal population. Great pleasure and profit, too, may be had by all of us in the study of nature, regardless of our knowledge of the Latin titles. Nevertheless, it would be well to have these symbols at hand for reference. They will be very useful in the days to come.

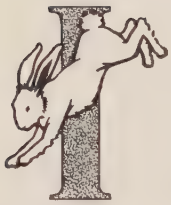
Some of our creatures, such as the Flicker, or the High-hole Woodpecker, have been given many common names in different parts of the country. Many call it the "wake-up bird," the "yellow-hammer," the "yellow-shaft," the "yellow drummer" or the "post driller." These are all nicknames. They confuse us because we have become familiar with the simple term, "Flicker." If we know, or are able to seek in a good bird book, the Latin name, there being only one, we need never be perturbed, for the code-word will be ours.

We have admired the little verse, written long ago, by Pope. It may well be applied to our use of names in nature.

"In words as fashions, the same rule will hold:
Alike fantastic if too new or old.
Be not the first by whom the new are tried,
Nor yet the last to lay the old aside."

CHAPTER FIFTEEN

NORTH AND SOUTH, EAST AND WEST



IN looking, figuratively, over the length and breadth of the land, we realize of course that in some sections different types of animals are to be found. Nearly all are likely to be either near or distant relatives of those animals with which we have become familiar in our own local region. On the other hand, there are certain birds and mammals to be discovered in widely scattered localities which are native or distinctive only to their particular home lands. As we well know, the distances are great from the Atlantic to the Pacific Ocean, and from Mexico to the center of Canada, below the Arctic Circle. Also, the characteristics of the intervening country are tremendously varied as to mountains, plains, lake areas and coastal lines with resulting changes in temperature and general climatic conditions. It is only reasonable, therefore, to expect a diversity of animal life over the broad expanse of the United States and Canada.

Often, as we explore our local woods and fields, observing animals whose habits are known to us, our thoughts turn to distant places and we wonder about other creatures, as yet unknown to us except through pictures or printed words. Whether we live in Massachusetts, California, Florida, Illinois or Texas, or in neighboring states, it is only natural for us to desire a know-

ledge of situations elsewhere. At some time or other in our lives, I believe we should all like to journey into new lands, to see different sights and to walk strange trails. So far, in this book, I have mentioned animals in the northeastern part of the United States; but what of the south, and the middle and far west?

FAR WEST

If I were a young naturalist, who lived in the Pacific States, or in the American Rockies, for instance, what creatures would I like to see? I shall make a list; first, the mammals.

THE MULE DEER: The large ears of this member of the deer family are responsible for its name. Compare its antlers with those of the Virginia Deer.

THE COLUMBIAN BLACK-TAILED DEER: According to Stone and Cram, the Columbian Black-tail "is in many ways intermediate between the Mule and the Virginia Deer." Discover the differences and the similarities and you will gain an idea as to the basis of this statement.

MOUNTAIN SHEEP: Though very seldom observed with ease, you should know something of the climbing ability, the feeding habits and the enemies of this clever sheep.

PIKA or LITTLE CHIEF HARE: The interesting traits of this dweller, upon rock slopes in mountainous districts of the north Rockies, are more than worthy of study. Look for their "hay stacks."

MOUNTAIN BEAVER or SEWELLEL: Compare the appearance and the habits of the "Beaver of the Hills" to those of the true Beaver and the Woodchuck.

FUR SEAL: In winter, this Seal ranges from its northern breeding grounds to California. In addition to seeing them, you

Photograph by Albert Butler. *Courtesy the Am. Mus. Nat. Hist.*

A LITTLE CHIEF HARE LOOKS ABOUT

would do well to learn of their lives during the summer months.

GRIZZLY BEAR: I should dislike either to visit or live in the Grizzly's territory without seeing one. He has fired the imaginations of many a naturalist. Even though a close acquaintance were impossible, at least, one may learn of his characteristics. What are the principal differences between a Black and a Grizzly Bear? The Grizzly still lives in certain of our National Park ranges as do the Black and "Brown" Bears.

THE BOB CAT and MOUNTAIN LION are two members of the cat tribe that are sometimes encountered in the western states.

Compare the Bob Cat with the Canada Lynx in reference to the ears. What is the natural, wild food of the Puma or Mountain Lion? Have you ever heard of its cries? Is it a courageous animal?

Obviously, there are numerous other interesting mammals in the region of which we have spoken. I have listed only a few outstanding and characteristic ones. The Pacific Coast birds are many, both as to kinds and numbers. I should like to see among many others, the following:

Western Grebe
California Murre
California Gull
White Pelican
Western Kingbird
Black Phoebe
Western Flycatcher
Desert Horned Lark
Californian Brown Pelican
Steller Jay
Western Crow
Clarke Nutcracker
Yellow-headed Blackbird
California Quail
Sooty Grouse
Western Mockingbird
Cactus Wren
Western House Wren
Oregon Chicadee
Gray-cheeked Thrush
Pygmy Owl
Western Bluebird
Red-shafted Flicker
Rufous Hummingbird
Magpie
Black-bellied Tree Duck
Western Sandpiper
Western Willet
Western Meadowlark
Scott Oriole
Oregon Ruffed Grouse
Sage Hen
Golden Eagle
Spotted Owl
California Screech Owl
Western Robin
Varied Thrush
Rocky Mountain Hairy Woodpecker
Anna Hummingbird
And Oh! So many Sparrows and Warblers

I would like especially to observe the Burrowing Owl, the

Photograph by Mary C. Dickerson. Courtesy the Am. Mus. Nat. Hist.
YOUNG CHICKADEES ON A LIMB

Dipper and the Road-Runner. The first lives in the ground in regular burrows, the second dives into and "swims" beneath the water of cool streams, and the third darts after and catches lizards!

Here are a few of the reptiles, west of the Rockies:

THE WESTERN SWIFT: True to its name, this lizard is "swift" in its actions. One has to be equally "swift" to catch it! Do you know something of the feeding habits of lizards? Some eat animal food and others plant food.

PACIFIC HORNED LIZARD: These lizards live very well in captivity, thriving on a diet of crickets, grasshoppers, flies and meal worms.

THE KEELED LIZARD: Widely distributed from lower California to British Columbia and eastward to Texas. The name "keeled" refers to the scales.

PACIFIC GARTER SNAKE: If you are fortunate enough to observe a number of different specimens, look for variations in color.

ONE-STRIPED GARTER SNAKE: This is a handsome fellow with an orange stripe down the middle of the back. It likes frogs and toads. Study the gait of the "one-striped." Does it differ from other snakes in its method of locomotion?

PACIFIC BULL SNAKE: When disturbed, this Bull Snake will hiss loudly and vibrate its tail, but, like all of the other snakes in this list, it is harmless.

PACIFIC BROWN SNAKE: A little snake, averaging about twelve inches in length, with short tail and blunt nose.

BOYLE'S KING SNAKE: Found in California, Arizona and Nevada. This is truly a beautiful snake as you will agree when you have seen one. Why do you suppose that this particular group of serpents are called "King" snakes?

CENTRAL WEST

In swinging the needle of our naturalist's compass until it points to the middle western states, we find mammals, birds and reptiles in plenty. Let us examine the mammals first, and then the reptiles. We will make excursions into the southwest to New Mexico, Texas, and the lower Mississippi Valley. While discussing these separated areas, it occurs to me that, before many years pass, it will be entirely possible for us to visit them with ease. Increased comfort and speed in our continental system of transportation will enable us, no matter where we live, to reach

far flung sections of the country with greater simplicity than ever before. Thus the mere names in this chapter and in the preceding ones are quite likely to be transformed into actual, first-hand observations of the animals in question. We can only hope that this accessibility of remote regions will not act as an ultimate agent of destruction to the wild life involved. If our National and State Park territorial boundaries could be extended in a reasonably direct relation to added facilities of travel, then new, wholesale animal tragedies would be, in a large measure, prevented.

If I were given the opportunity to see various animals of the central western states, these are the ones I should select. Among mammals—

JACK RABBIT: Despite their numerous enemies, the Jack Rabbits multiply and go about their everyday activities over a great area of the middle west. Learn how rabbits escape from various enemies. The Black and the White-tailed Jack Rabbits are different species.

PRAIRIE MEADOW MOUSE: Locate the burrow of this little mouse, and if you can, excavate it and trace the directions of the chambers. Make a drawing of the results of your labor and you will then be able to explain your observations to others.

PRAIRIE DOG: In certain parts of the west, it would be difficult to avoid seeing evidence of the Prairie Dog's presence. Many quiet hours, spent in careful observation of the habits of these rodents, will result in considerable knowledge as to the "gnawing" family in general. What do they eat? How do they watch for danger? Do they signal to one another? Is there any truth in the statement that owls and snakes live

Photograph by Mary C. Dickerson. Courtesy the Am. Mus. Nat. Hist.

JACK RABBIT

peacefully in the same hole and at the same time with the Prairie Dog?

STRIPED SPERMOPHILE: These rodents are near relatives of the Chipmunks. They are sometimes called "Striped Gopher."

KANGAROO RAT: This "jumper" is native to Arizona, New Mexico and western Texas. Mr. Ernest Thompson Seton, who once kept a Kangaroo Rat in captivity, wrote ". . . he was the embodiment of restless energy. Palpitating with life from the tip of his translucent nose and ears to the end of his vibrant tail."

Photograph by Mary C. Dickerson. Courtesy the Am. Mus. Nat. Hist.

ONE UP AND ONE DOWN! A PAIR OF JACK RABBITS

POCKET GOPHERS have large cheek pouches, "opening outside the mouth." They are about at night and live in burrows in the ground. Of their homes Vernon Bailey says, "Gopher burrows seem to have no beginning and no end." Have you ever seen a gopher-hill?

AMERICAN BADGER: The wary Badger seldom wanders a very long distance from his burrow. He lives upon small mammals, insects and reptiles. His powerful fore limbs enable him to dig up the earth with speed and precision. Though not often abroad in daylight, the Badger occasionally strays, and enough patience may show him to you.

COYOTE or PRAIRIE WOLF: I once asked a young friend who had spent a season in New Mexico, "What mammal did you notice the most while you were in the southwest?" He replied, "The Coyote." It was the night "music" of these wolf-like creatures that made the greatest impression. He saw several of them slinking away, as he rode through the country, but not once did he get a close view.

NINE BANDED ARMADILLO: This digger in the soil lives in southern Texas. How is he protected from enemy attacks? Compare him in this respect to the Porcupine and the Skunk.

And among reptiles—

WESTERN PAINTED TERRAPIN: Except for coloring, it would be quite difficult to distinguish this Terrapin from the eastern species. It lives well in an aquarium, feeding on worms, chopped beef and fish and insects.

CHUCKAWALLA: A lizard of the southwestern deserts. I once had one for a pet, but he never seemed to care whether school kept or not, and did not live very long. I am told that in their native habitat, they live upon vegetable matter.

TEXAS HORNED "TOAD": Of course this harmless little creature is not a "toad"; he is a lizard! What do you know about the "burrowing in" habits of the Horned Lizard?

THE GILA MONSTER: This desert reptile is a true "beaded lizard." I once kept one that proved not at all as vicious as his kind are said to be in a wild state. He delighted in raw eggs and loved the strong summer sun.

FOX SNAKE: Fairly common in Ohio, Iowa and Illinois, according to Dr. Ditmars. A Fox Snake I had at one time made an excellent pet, and did not attempt to bite when handled.

SOUTH

Like a restless twig, drifting merrily along on the surface of a running brook, we have skipped rather breathlessly from place to place; touched briefly here, hesitated for a moment elsewhere and continued on our way through the states. Various animal landmarks have caused us to pause on our journey; but never have we stopped long enough! Now we come to Florida and the southeastern states, glancing at several of the outstanding creatures of this region. The mammals are—

MARSH HARE: This inhabitant of northern Florida, Georgia and the Carolinas reminds one of the Cottontail Rabbit in appearance, although it is a bit larger. Water holds no terror for the Marsh Hare, for, living as it does in swamps, it plunges frequently into pools.

COTTON RAT: Throughout the south, the Cotton Rat holds forth. Its long, "scantily haired" tail will serve to distinguish it from the Meadow Mice which it somewhat resembles. It builds an underground nest.

Photograph by Mary C. Dickerson. Courtesy the Am. Mus. Nat. Hist.
COTTONTAIL RABBIT

HARVEST MOUSE: A tiny mammal which nests on the ground. It is one of the smallest of our mice.

SOUTHERN FOX SQUIRREL: "The largest of the true native squirrels" according to Stone and Cram. Often black and gray varieties are found in the same litter.

GRAY FOX: This fox will readily climb trees when the occasion arises. One that I kept for a time was decidedly playful, yet like his wild relatives, he was exceedingly nervous and wary.

Here are some reptiles—

ALLIGATOR SNAPPING TURTLE: A very powerful turtle is this one! It ranges from western Florida to the Mississippi

River. A bite from the jaws of this Snapping Turtle is a dangerous thing.

CHICKEN TURTLE: The extended, reptilian neck of this little turtle gives it a "snaky" appearance. Look for a yellow stripe running down the under part of the fore limb.

FLORIDA TERRAPIN: A high "dome-shaped" upper shell, or carapace, marks the individuality of this swimmer. It also has a very small head in proportion to its body.

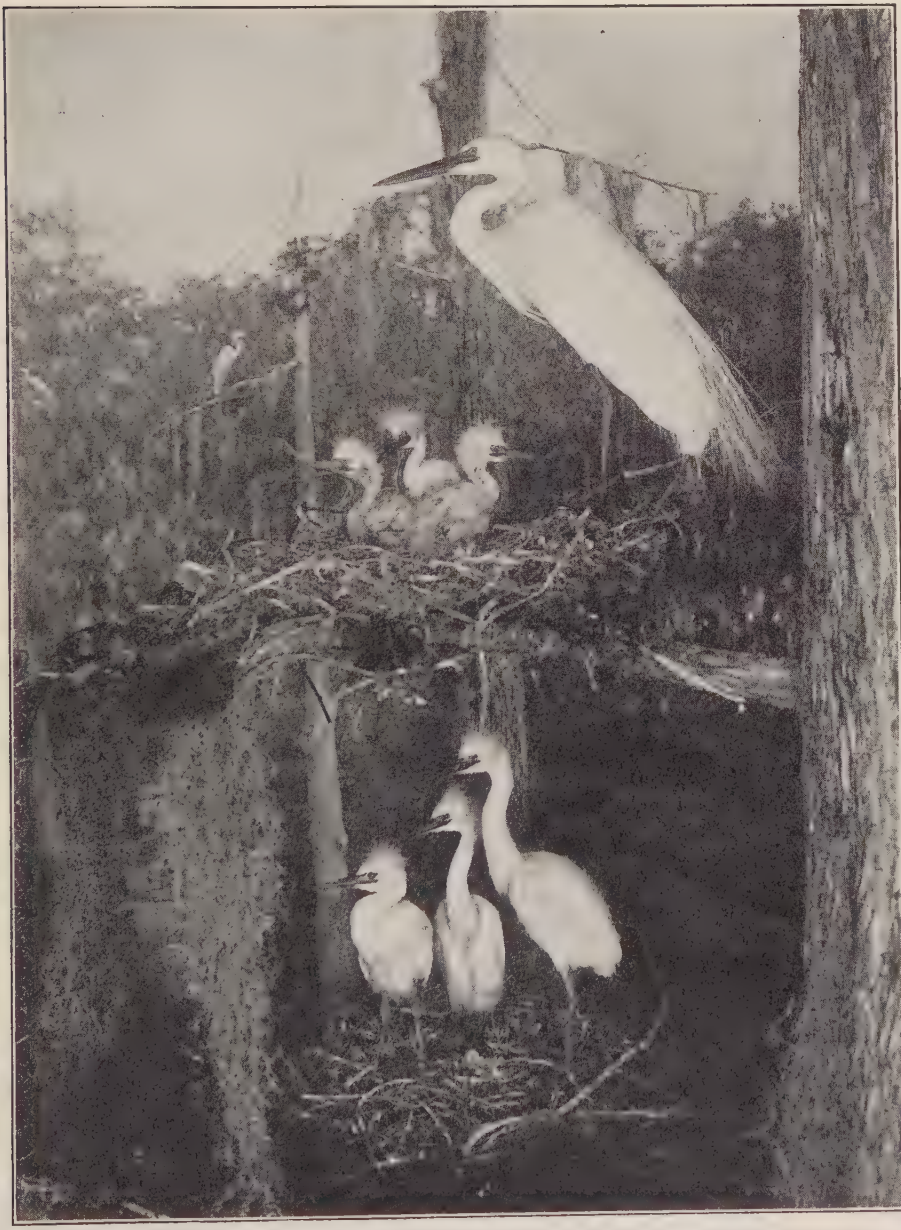
GOPHER TORTOISE, a burrowing tortoise and a strong fellow; a typical member of its tribe. Do you know how its eggs are incubated?

ALLIGATOR: Why describe the Alligator? His appearance is familiar to us, yet do we know how he differs from the Crocodile? Do we know his feeding habits? If I lived in his territory, I should try to learn about these things from personal observation. Also, I would visit an alligator "farm" and not only look, but make notes.

GOPHER SNAKE: Many, many times I have used the placid Gopher Snake in lectures. Even the largest specimens that I have handled were most docile and calm. Due to its beautiful, shiny, bluish-black scales, it is also known as the "Indigo Snake."

COACHWHIP: A long, slender, reptile with a whip-like tail. Some individuals have measured eight feet in length. Dr. Ditmars writes that a full-grown Coachwhip Snake will, "consume several mice or animals of a similar size about every five days."

CHICKEN SNAKE: A yellowish snake that is not at all averse to climbing trees. Those that I have kept, invariably, preferred to rest in tree branches placed within their cages.



Courtesy the Am. Mus. Nat. Hist.

EGRET GROUP IN THE AMERICAN MUSEUM OF NATURAL HISTORY

They are to be found throughout the southeastern states.

I have left the birds of the southeast until last. They are numerous and exceedingly interesting. Some of those mentioned in the following list stray to other parts of the country. In the main, however, they are typical birds of the south.

WATER TURKEY, SNAKE BIRD or ANHINGA: Its ability to remain beneath water for a time; its strange, serpent-like neck and its undoubted habit of destroying the young of certain harmful snakes mark the Water Turkey as a bird well worthy of your attention.

WOOD IBIS or FLINT HEAD: According to Harold H. Bailey, the Wood Ibis feeds upon "many varieties of small fish, snakes, crawfish, snails, lizards and frogs taken from the shallow waters they inhabit."

THE EGRETS of the south are familiar to many. The story of their slaughter for feathers has been widely mentioned, but not widely enough! Both the Egret and the Snowy Egret are still being killed, regardless of laws passed to protect them.

SANDHILL CRANE: This large bird, a true Crane, with the "red cap" upon its head, is a sight to remember. When taken young, which seems rather a pity, they become quite tame and are said to free house grounds of insect pests.

EVERGLADE KITE: The hawk-like Kites are strong graceful flyers. Three others that live in Florida are the SWALLOW-TAILED, the WHITE-TAILED and the MISSISSIPPI KITES.

THE TURKEY VULTURE and the BLACK VULTURE or "Carrion Crow" are two scavengers that are plentiful in the south. The former sails for hours on the air currents and to the eye, it seems that its wings are motionless. The Black Vulture has a

short tail. It also beats the air with its wings more frequently than the Turkey Vulture.

We have concluded our extraordinarily rapid march across country in search of animal landmarks. We realize, of course, that many are the ones we missed while swinging along.

As I finish this page, April is beckoning outside my window. Birds are returning, a few insects are trying their wings, and the hepatica has come into its own amid last year's dead leaves on countless woodland hillsides. Nature is stirring to the call of Spring! Thousands of us will be heeding this summons with our eyes truly open, our ears alert and our minds atune, the better to appreciate all we see and hear. I must leave you now. I, too, am bound for the out-of-doors!

The following is a list of books related to this chapter which may be of use to you, depending upon where you live.

"The Mammals of Colorado," by E. R. Warren. G. P. Putnam's Sons, New York.

"California Mammals," by Frank Stephens. West Coast Publishing Company, San Diego, California.

"A Biological Survey of Alabama," Part 2 "Mammals," by Arthur H. Howell. Government Printing Office, 1921 (North American Fauna Series No. 45).

"Field Book of North American Mammals," by H. E. Anthony. G. P. Putnam's Sons, New York.

This is a general book, covering, as its title indicates, all of our mammals.

"Birds of the Pacific Coast," by Willard A. Eliot. G. P. Putnam's Sons, New York.

"Birds of North Carolina" by T. Gilbert Pearson, C. S. Brimley and H. H. Brimley. A publication of the North Carolina Geological and Economic Survey, Raleigh, 1919.

"The Birds of Florida" by Harold H. Bailey, with many color plates by George M. Sutton.

For Reptile references, consult Dr. Ditmar's "The Reptile Book," previously mentioned.